FOUNDRY

EST. 1902 TRADE JOURNAL

WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

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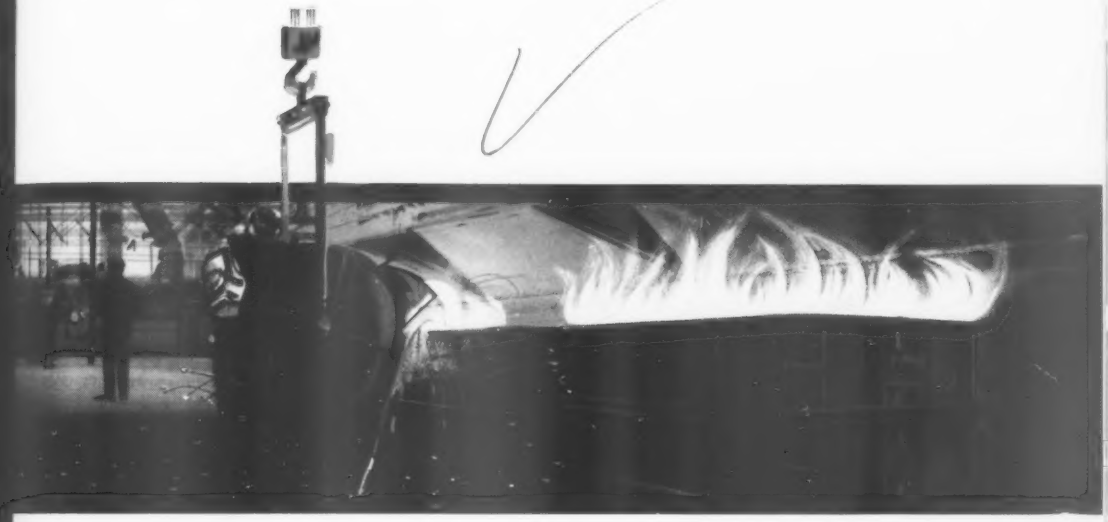

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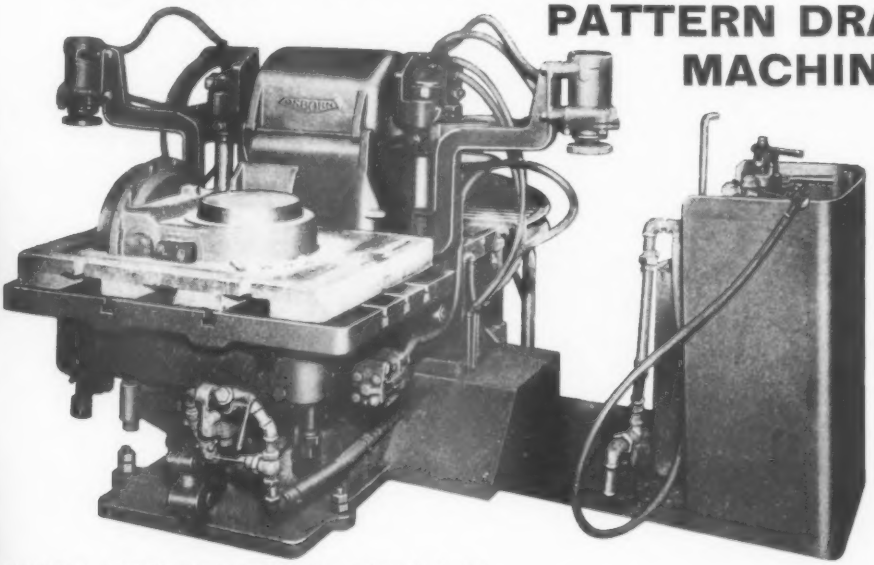
OSBORN JOLT ROCK-OVER PATTERN DRAW MACHINES



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	242 W. M/C	643 M/C
MAX. BOX DIMENSIONS OVERALL :—		
LENGTH	OPEN END	OPEN END
WIDTH	30″	38″
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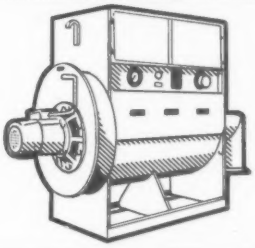

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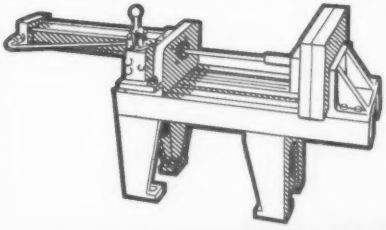

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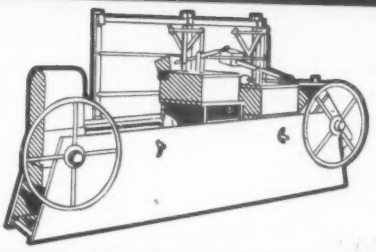

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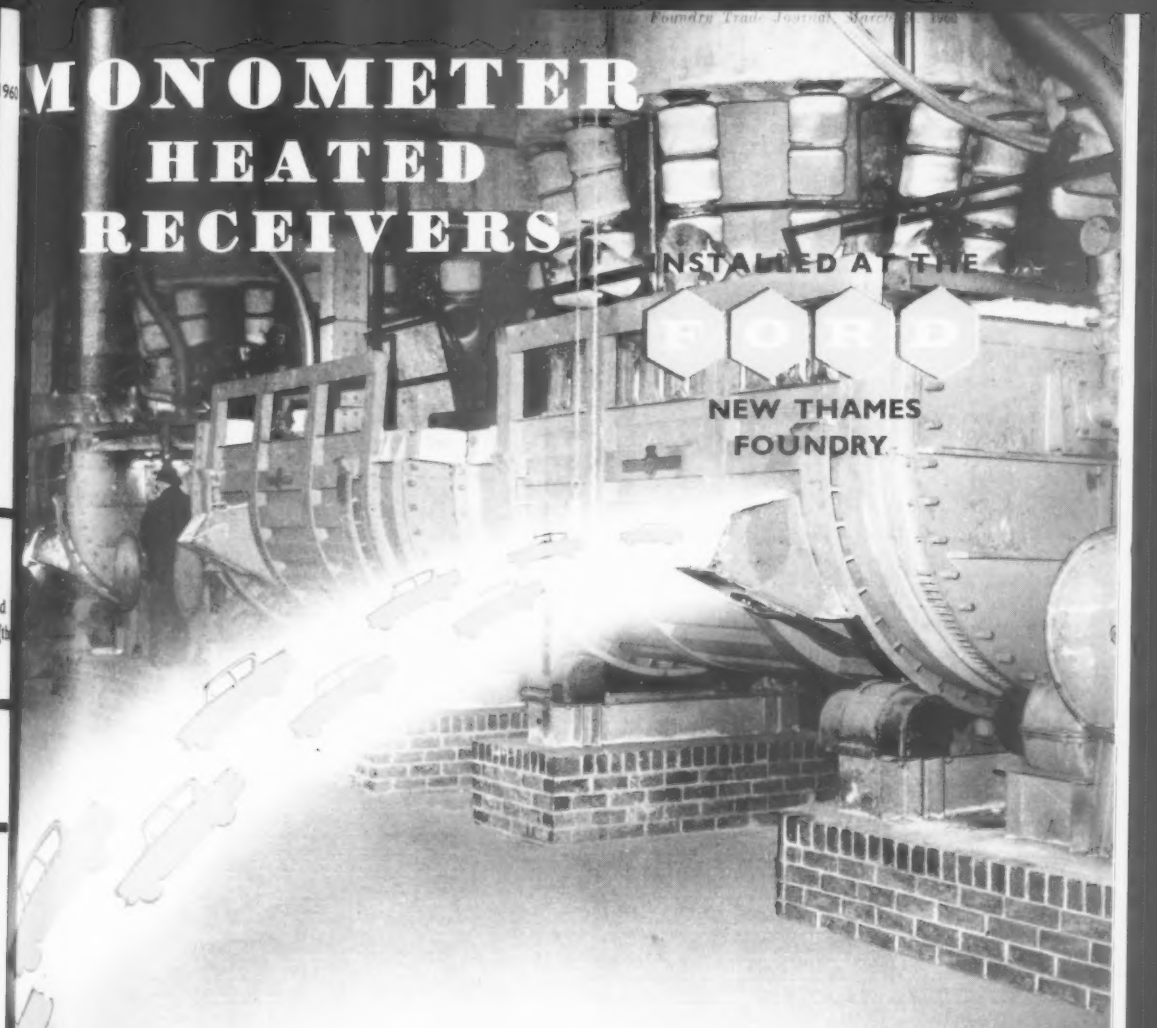

Installation of four 8-Ton Hot-metal Receivers supplying molten iron to the casting bay at Ford's new Thames Foundry. Castings for the **NEW FORD Anglia** are produced from metal at temperatures as tapped from the cupolas.

Receivers may be fired by oil or gas and are available in a wide range of capacities, with motorised or manually-operated tilting.

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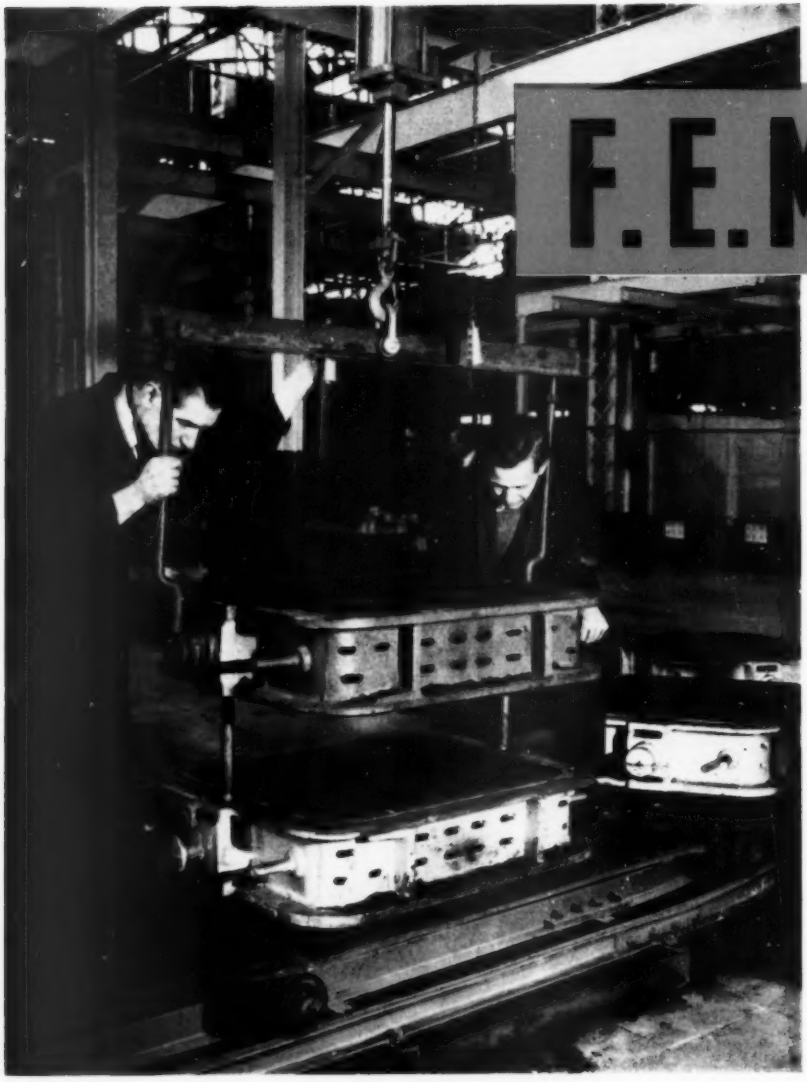

Closing a large mould is easiest on an F.E. Platform Conveyor—the only Mould Conveyor which is truly jerk and judder free. We illustrate one of the two long Conveyors (each 73 plates 2′ 6″ wide × 5′ 0″ long) recently supplied to a large automobile castings foundry in Australia. The complete installation was supplied by us.

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. . . this is proved by the number of leading Companies who install F.E. Mould Conveyors to fulfill one of the vital requirements of continuous casting.
F.E. Mould Conveyors have achieved the highest reputation in the world for design, performance, reliability and precision movement. Only F. E. Conveyors have all the "Star" points!

- ★ **Continuous platform—interlocking, machined, dead level plates—no gaps.**
- ★ **Safe and clean operation—no metal through to track.**
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- ★ **No long chain—no wheel corners.**
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- ★ **High load carrying capacity for maximum production.**

British Patent No. 780440. Patents granted or pending in other industrial countries.

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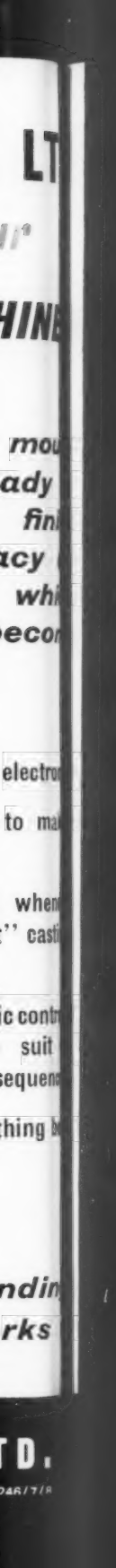
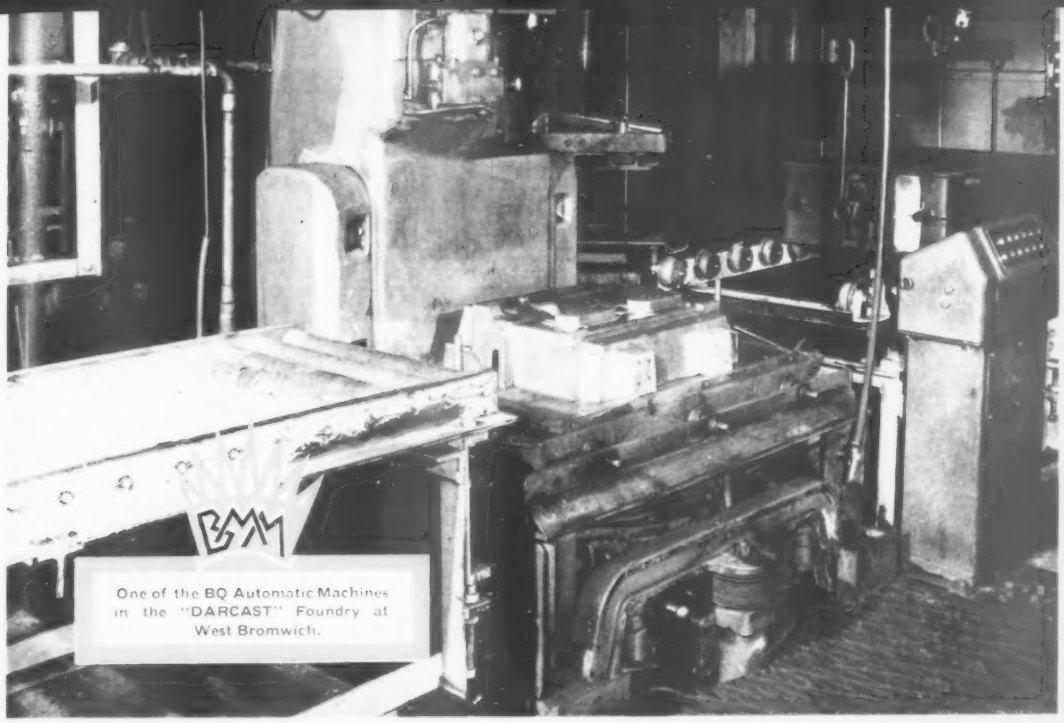
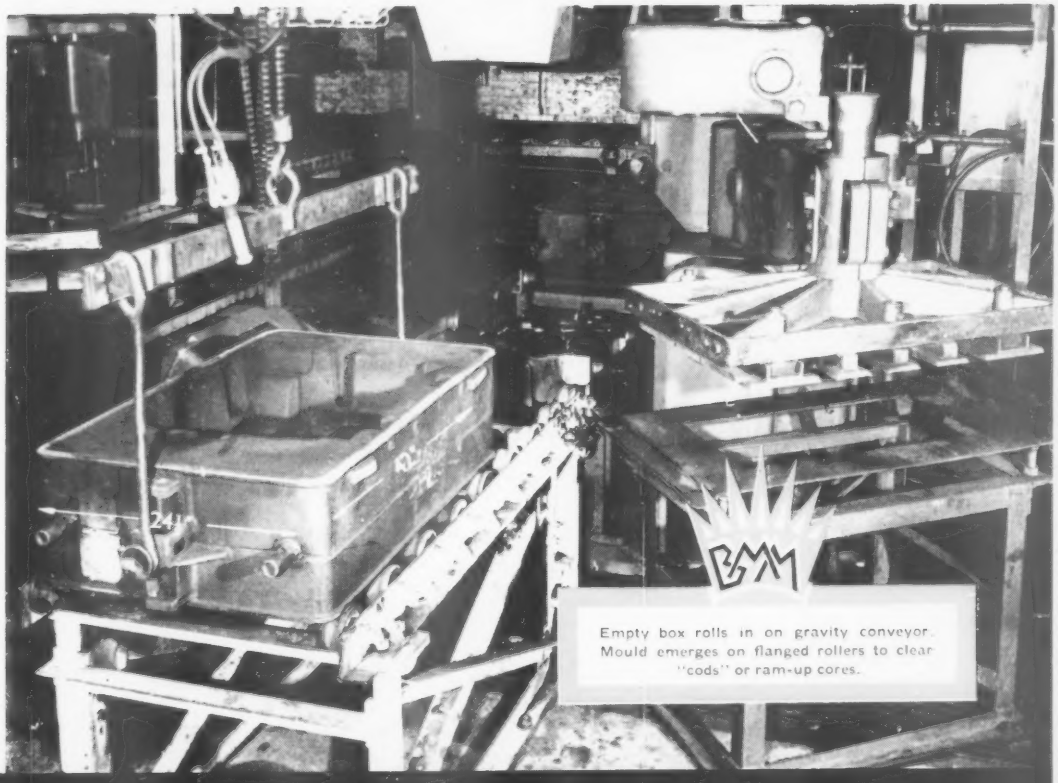




One of the BQ Automatic Machines in the "DARCAST" Foundry at West Bromwich.



Empty box rolls in on gravity conveyor. Mould emerges on flanged rollers to clear "cods" or ram-up cores.

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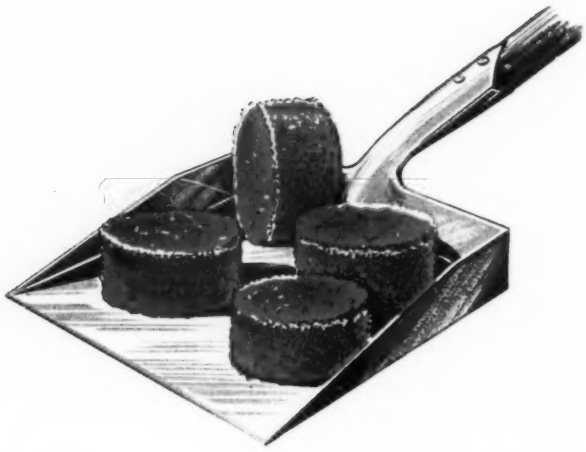

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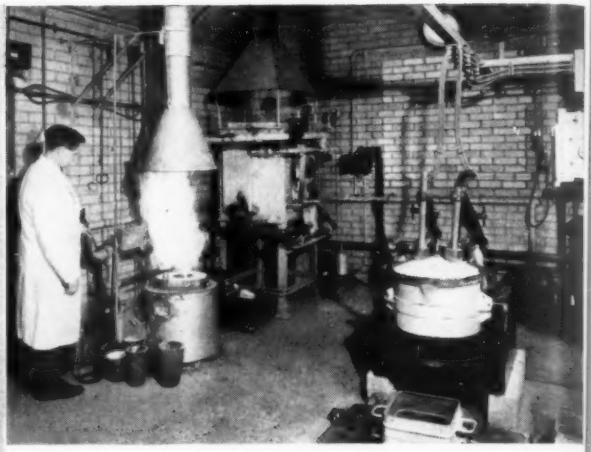

If you should be faced with a technical problem in connection with casting defects in foundry sands, you are invited to call on the facilities of our experimental foundry and sand testing laboratory. In addition, our foundry technicians will be pleased to visit any foundry man who might wish to discuss a particular difficulty on the spot.

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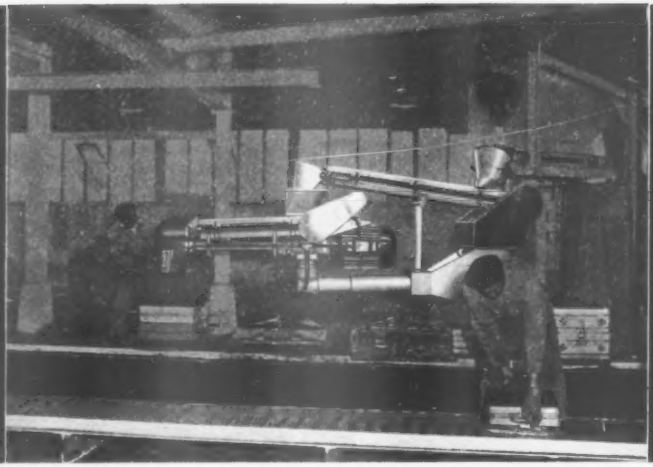
One of our S.P.M.'s in production

ON JOBBING WORK—BUT UNDER A CONTINUOUS PROCESS!



The above photograph, appearing by the kind permission of The Alliance Foundry Co. Ltd., of Luton, Beds., shows one of our Sand Projection Machines No. 6, which has been installed and is now operating in their Foundry.

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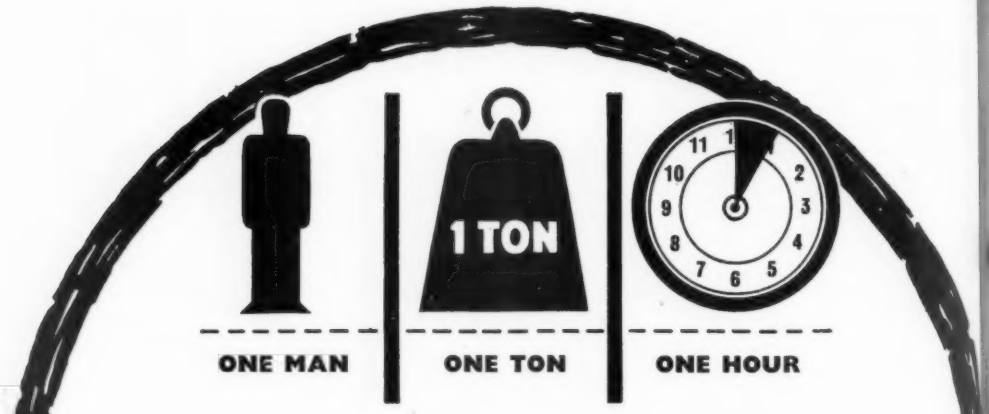

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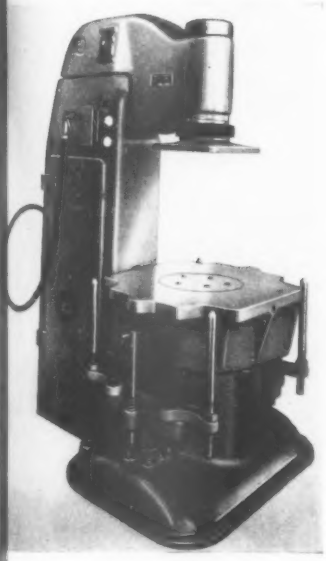

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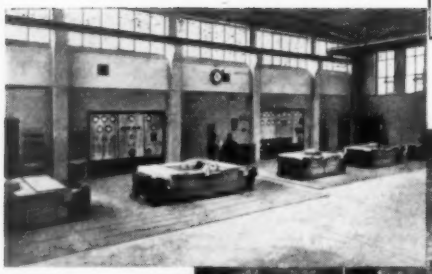
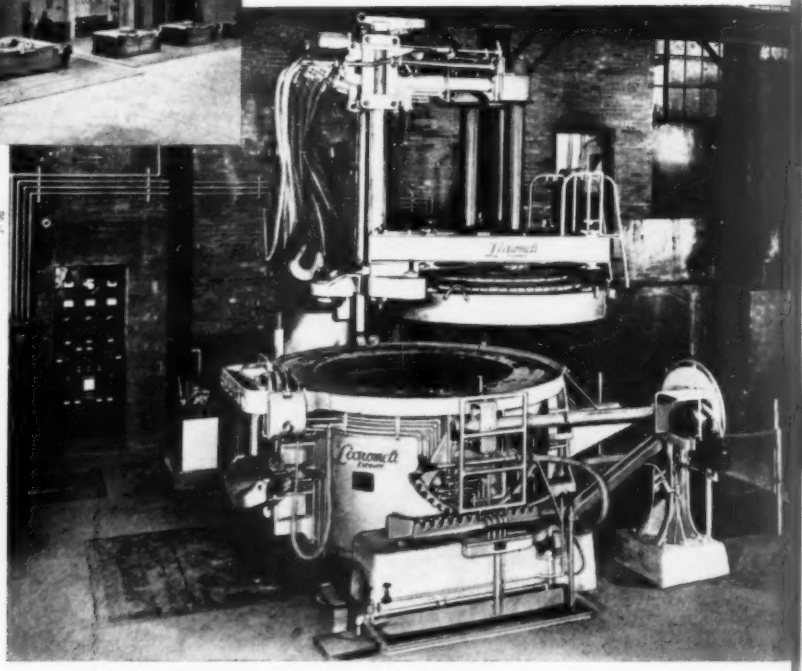


Demag high-frequency induction furnace installation at a steel making plant, incorporating two 1 ton capacity furnaces, two 660 lb. capacity furnaces, and one 110 lb. capacity furnace.



A 3 ton capacity Lectromelt arc furnace of 9' 0" diameter shown with roof swung ready for charging.

High Speed and High Output are the key features in the medium and smaller range of furnaces offered by G.W.B. Furnaces Ltd. Many years of experience are behind both the Coreless and Arc Furnaces of Demag and Lectromelt designs. Daily, electric furnaces are finding wider and wider applications, and the coreless induction (crucible) type is no exception as it is an ideal medium for melting steel and iron, and all other metals. It is particularly advantageous in steel works where a charge of scrap of known analysis is melted and is an installation that pays for itself in a very short time. The proven economies of operation of electric arc furnaces offered by G.W.B. have earned an enviable reputation, and a few of their outstanding features are:—

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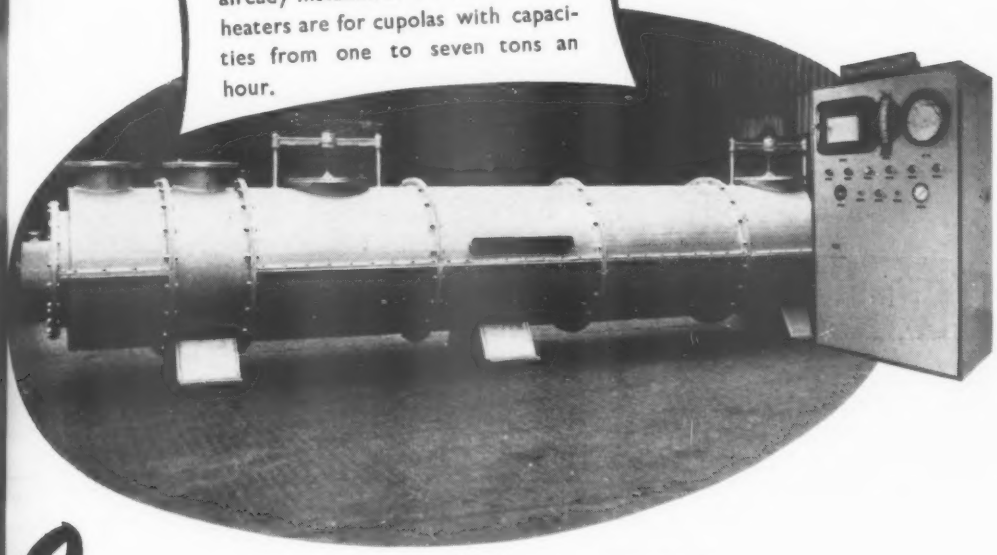
EIGHT

Incandescent hot blast heaters are already installed or on order. These heaters are for cupolas with capacities from one to seven tons an hour.



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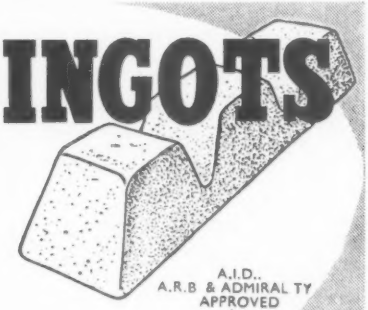

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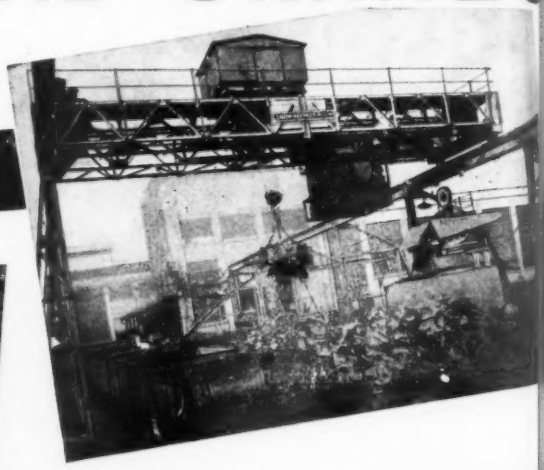

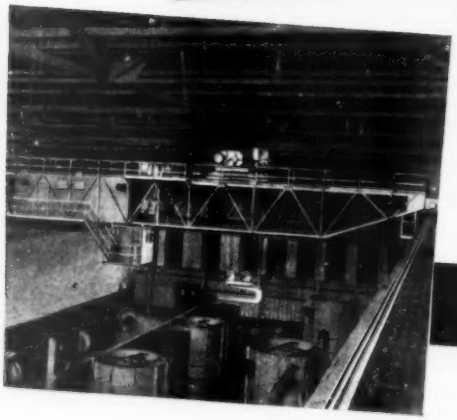

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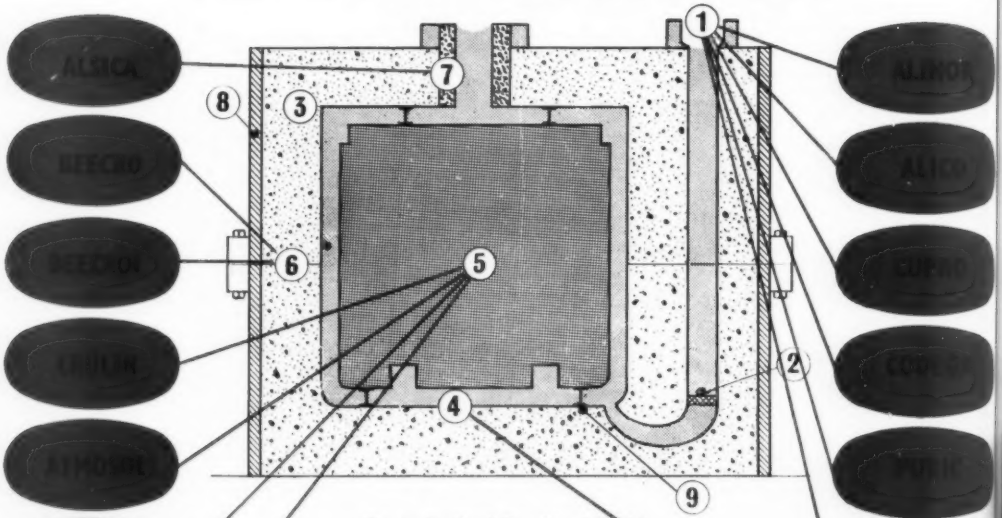

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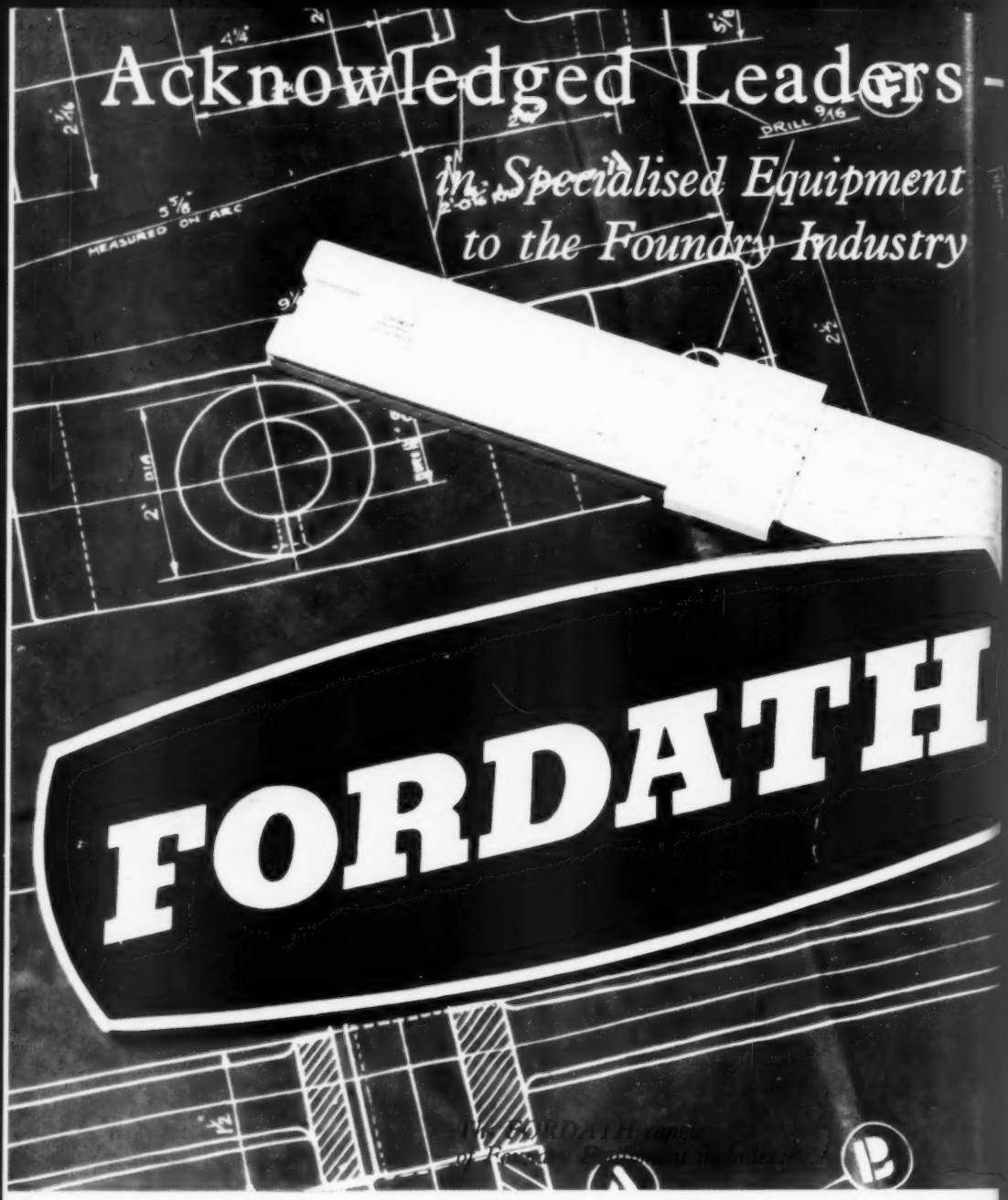

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Photograph shows part of a battery of four Hydro-Filters handling over six million cubic feet of air per hour in the control and collection of dust from all foundry departments.

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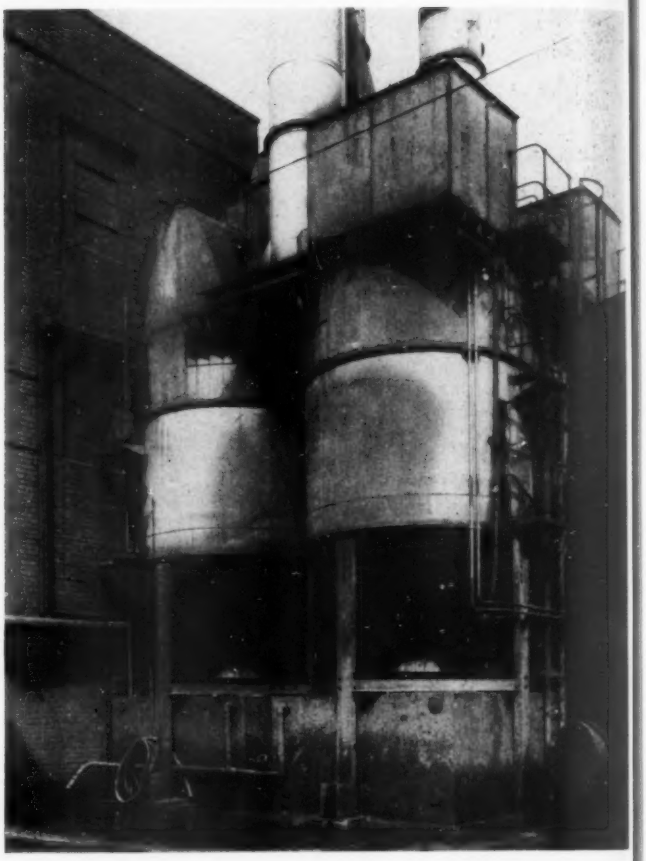

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Vol. 108 March 24, 1960 No. 2259

Foundry Foremen's Conferences

There was a concensus of opinion at last week's IBF Foundry Foremen's Training Course held in Harrogate, that its title should be changed to Foundry Foremen's Conference as the old name indicated systematic and progressive lectures. Actually, it *is* a conference and much enlightened opinion and good suggestions come from the "body of the hall." The meeting opened with a division of the delegates into four discussion groups to get a cross-section of opinion as to the future venue for these conferences and their lecture content. From these groups, the following suggestions were forthcoming for the conduct of future meetings: That a prominent overseas foundry personality should be asked to address the conference; that lectures should be given on sand-quality maintenance, work-study, and testing, in addition to those being presented at the current meeting (*i.e.*, on plant maintenance, apprentice training, costing and safety and health) and that trade union agreements and the inclusion of a good foundry film would be welcomed.

The attendance was not as good as in earlier meetings, due no doubt to the boom in trade and the difficulty of releasing key-men—such as foremen undoubtedly are. The lecturers were particularly well chosen and the opening speaker, Mr. A. Kirkham, dealt with the elements of foundry costing in such a manner as to indicate to his audience the essential rôle of cost data in the provision of figures useful to him, underlining the need for speed in their availability. Mr. W. D. Ford dealt with plant maintenance and his discourse was of the type which was of real help to the foremen in the prevention of shutdowns, due to failure. Mr. A. Talbot, covering the subject of apprentice recruitment and training, insisted that despite apprenticeship schools, personnel offices and specialized vocational schools, the actual systematic teaching of the boys was still the function of the foremen. From experience, he had found that of every ten boys entering his foundry, he only managed to turn out three skilled craftsmen.

The final lectures, by Dr. Gillies MacBain on dust-prevention and by Mr. G. C. B. Lamb on automation, were alike informative and really profitable. Employers who were good enough to release their foremen have our assurance that their money was well spent and we advise them to make a point of personally interviewing their delegates following their return, for some of the advice given could be implemented best by boardroom decisions. Not only in the conference hall was information broadcast, but also as a result of talks with the lecturers and amongst delegates themselves. More information will be obtainable by colleagues of a returning foreman from informal talks than by the insistence on his making a time-consuming written report.

Latest Foundry Statistics

Steel Castings: According to the monthly *Bulletin* issued by the Iron and Steel Board and the British Iron and Steel Federation, the average weekly production of steel castings during February was estimated at 5,700 tons—a distinct improvement on January. The employment figure for steel foundries, taken on January 9, shows an increase of 60 over the 17,670 for December 5, 1959, but it is still 23 below the January, 1959, total. Female labour has remained constant at 60 over the year.

Light-alloy Castings: The Ministry of Aviation has now issued the final figures for production of light-alloy castings in 1959. These show that of the 93,706 tons of aluminium castings produced, 20,068 tons were made from sand moulds; 51,228 tons were gravity-die and 22,410 tons were pressure-die castings. The output of magnesium-alloy castings was 1,802 tons.

Copper-base Castings: The statistical *Bulletin* of the British Bureau of Non-Ferrous Metal Statistics announces that the production of copper-base castings during January was 7,111 tons. In January, 1959, it was 6,110 tons—thus a good start for 1960 was made.

A GIFT OF £40,000 for experiments in cosmic-ray showers has been made by the Department of Scientific and Industrial Research to Leeds University.

Forthcoming Events

MARCH 28

Institution of Production Engineers

Manchester section: Annual general meeting followed by "Economics of Machine-tool Purchase," by J. Borsay, 6.30 p.m., at Reynold's Hall, Manchester College of Science and Technology, Sackville Street. (Joint meeting with graduate section).

MARCH 29

Institute of British Foundrymen

Slough section: Annual general meeting followed by a paper on "The New Metals," by Mrs. M. K. McQuillan, 7.30 p.m., in the Lecture Theatre, High Duty Alloys, Limited.

MARCH 29-31

Institute of Metals

Spring meeting at Church House, Great Smith Street, London, S.W.1. (Details from secretary).

MARCH 31

Southampton Metallurgical Society

Annual general meeting followed by "Stress Corrosion," by Dr. K. Farmery, M.A., 7.15 p.m., in the Engineering Block, Southampton University.

Institute of Metals

Dinner/dance at Grosvenor House, Park Lane, London, S.W.1, at 7.30 p.m.

APRIL 2

Institute of British Foundrymen

Wales & Monmouth branch: Annual general meeting, 6 p.m., at the Engineers' Institute, Cardiff.

All Stanton Blast-furnaces back in Commission

As briefly reported in the JOURNAL last week, all five furnaces at the Stanton works of the Stanton Ironworks Company, Limited, near Nottingham, are now in blast as a result of substantial improvement in the pig-iron market. The No. 5 furnace, which has been out since September 8 last year, was lighted by Miss Margaret Wilson (16), daughter of Mr. C. H. Wilson, president of the Institute of British Foundrymen and assistant to the assistant managing director (works).

The furnace was blown out last September for relining and repairs. During relining, the hearth diameter was increased from 16 ft. 6 in. to 19 ft., an increase of about 15 per cent. It thus becomes the largest Stanton blast furnace. The furnace has been fitted with the same underhearth cooling method as for No. 3 furnace, but with improvements in design. No. 3 furnace, which was blown in in 1958, was the first blast furnace in the country to have underhearth cooling, a method which has proved itself satisfactory.

The stack volume of No. 5 furnace has also been increased by using a thinner lining than normal, but in low-porosity firebrick with a very high resistance to abrasion. The bricks have been laid in a spiral design to obviate loss of time in fitting closure bricks necessary in the conventional method of lining a furnace. It is the first stack lining in the country to be constructed in this way. When fully commissioned, the furnace is expected to produce 2,500 to 3,000 tons of pig-iron a week.

Mr. E. M. Summers, general manager (iron production), opened the ceremony and Mr. G. F. Buckley, assistant manager director (works) introduced Miss Wilson. Afterwards, a presentation was made to Miss Wilson by Mr. P. J. Walsh, 66-year-old furnaceman, who has been with the company for 43 years.

Miss Margaret Wilson, daughter of Mr. C. H. Wilson, national president of the IBF, lighting the No. 5 furnace at Stanton Ironworks Company, Limited.

Eccentrically-revolving Ladle*

Description of a New Metallurgical Device which has proved particularly helpful in the Production of High-grade Cast-iron

By Sven Eketorp and Bo Kalling

Experience gained with a Swedish method for the desulphurization of iron in a rotary furnace, and theoretical considerations regarding the mixing of molten metals, have led to the development of a revolving ladle which can be described as a metallurgical device for carburizing and desulphurizing molten iron, and alloying it—silicon and vanadium being eliminated by oxygen refining. After a description of the design of both the original and the improved ladles, an account is given of large-scale experiments which proved the technical and economic advantages of this new method.

The importance of stirring and mixing of molten metal when carrying out metallurgical reactions has been recognized for some years. Frequently, it is not sufficient merely to establish the thermodynamic conditions to guarantee that the required reaction will take place; it is also necessary to maintain the speed of reaction by adding the materials taking part in the reaction quickly enough, or to remove them from the area of the reaction—this can be achieved by correct mixing.

Stirring of the molten metal results in the enlargement of the contact surface between the phases, and the equalization of the concentrations within each phase. Mixing becomes particularly important when success depends on good contact between solid powdery materials and molten iron, which is a necessary condition when desulphurizing pig- or cast-iron with lime or calcium carbide. In this case the speed of desulphurization is entirely dependent on the degree of intensity of contact achieved between the desulphurizing agent and the molten iron. Known methods for obtaining optimum contact between molten iron and additional materials include: (1) A French process, by Trentini, Wahl and Allard[1], in which lime powder is injected into the bath of molten iron by means of a stream of nitrogen or oxygen, and (2) a Swedish process, by B. Kalling[2], developed by the Research Centre of the Stora Kopparbergs Bergslagets AB, Domnarfvet, Sweden. The latter method uses a horizontal, quickly-revolving rotary furnace, in which the molten iron is brought into close contact with lime powder which is added before rotation. This is a very simple piece of equipment, but has the disadvantage that the rotary furnace can only deal with a relatively small quantity of molten iron in relation to its own volume.

For this reason the authors tried to find a better procedure, and they succeeded in 1958 in producing satisfactory results with an eccentrically-revolving ladle. This method soon attracted the attention of interested trade firms, and the German firm Gesellschaft für Hüttenwerksanlagen m.b.H., Düsseldorf, obtained a licence for the process. This firm designed and installed, in co-operation with Mannesmann-Meer A.G., of München-Gladbach, a three-ton eccentrically-revolving ladle, suitable for normal foundry practice, as a pilot plant (see Fig. 1).

Principle of the Revolving Ladle

The basic idea of a revolving vessel has been known for a long time, and is being used on a small scale for liquids. By revolving the vessel which contains the liquid in such a way that it describes a circular movement without rotating around its axis, the liquid is set in motion as shown in Fig. 2. Large-scale experiments were carried out, in which a vessel (as indicated schematically as an inset in Fig. 2) was filled with 68 gall. of

FIG. 1.—*Three-ton capacity eccentrically-revolving ladle which was used as a pilot plant.*

* Abstracted by Dr. O. P. Einerl from a paper published in *Giesserei*. The authors are attached to the Domnarfvet Research Centre, Sweden. An extended version of the paper was published also in *Jernkontorets Annaler*.

Eccentrically-revolving Ladle

water (equivalent to two tons of liquid iron)—the depth of the water in the bath being 20 in. at standstill. The vessel was then revolved with various eccentricities and changing revolutions per minute (eccentricity is defined as the radius of the circle described by the central axis of the vessel). During revolving the bath surface took on the shape shown in Figure 2, and the height of the "billow" was measured and plotted on the graph in that diagram in relation to eccentricity and revolutions per minute. It was discovered that with an eccentricity of 2.4 in., the bath surface "rolls" but no appreciable mixing effect occurs before a speed of 50 rpm has been reached. At this "critical speed" a peculiar wave movement starts, comparable to the surf of the sea, and quite different and more favourable mixing conditions are obtained than with a lower revolving speed. The curve representing the height of the liquid in the bath has a dip at this critical speed—when the revolving speed is further increased, this again increases. The undulating surface of the liquid takes the shape of a paraboloid, the axis of which is parallel to the central axis of the vessel around which it revolves, and it revolves at a distance which is determined by the eccentricity chosen. If the revolving speed is much in excess of the "critical speed" the mixing effect seems to deteriorate. When a lower eccentricity, *e.g.*, 1 in. is used, the wave movement starts only at a slightly higher speed of about 60 r.p.m. For practical use in a foundry, high waves must, of course be avoided, and eccentricities of between 2 and 4 in. are preferred.

Metallurgical Applications

The experiments carried out at the Domnarfvet Research Centre, using a three-ton revolving ladle, have proved that the ladle is an excellent device wherever intensive mixing has to be achieved. Applications described below will include cases of mixing molten iron or steel itself, and the creation of intensive contact between the iron and a solid, liquid or gaseous reaction component.

Desulphurization of Cast Iron

In order to desulphurize pig- or cast-iron with lime, reducing conditions must be maintained in the desulphurization vessel, and close contact between the molten iron and the finely ground burnt lime must be achieved. As shown in Fig. 3 and

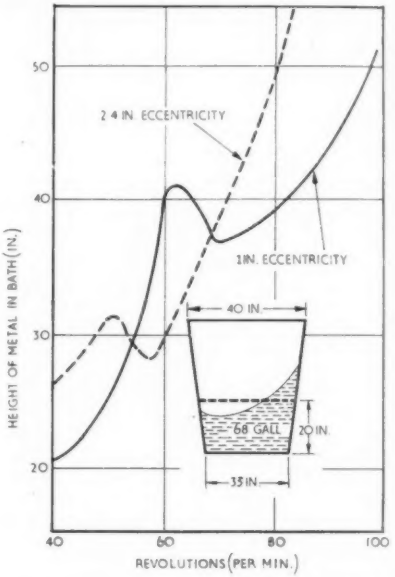

FIG. 2.—*Diagram illustrating the basic principle of the ladle, which revolves in such a way that it describes a circular movement without actually rotating around its own axis.*

Table 1, a very effective desulphurization can be obtained with the revolving ladle. About 95 per cent. of the sulphur content can be removed in all

TABLE 1.—*Data from Four Experiments on Desulphurization of Pig-iron in a Revolving Ladle*

Experiment No.	Pig-iron (tons).	Lime (per cent.).	Coke breeze (per cent.).	Soda ash (per cent.).	Eccentricity (in.).	R.p.m.	Revolving time (min.).	Composition (per cent.).		
								C.	Si.	S.
SK 3 ..	2.1	2.3	1.0	—	2.4	70	0	3.45	0.42	0.078
							5	3.75	0.35	0.027
							10	3.75	0.34	0.012
							15	3.90	0.31	0.009
							20	3.90	0.31	0.007
							30	3.90	0.31	0.003
SK 6 ..	2.6	1.5	0.6	—	2.4	70	0	3.50	0.40	0.213
							5	3.70	0.35	0.055
							10	3.74	0.34	0.032
							20	3.79	0.34	0.020
							30	3.88	0.32	0.013
SK 9 ..	2.3	1.7	0.7	0.1	2.4	75	0	3.46	0.07	0.163
							5	3.48	0.03	0.042
							10	3.62	0.02	0.020
							20	3.62	0.02	0.011
							30	3.62	0.02	0.009
SK 61 ..	2.5	1.6	0.8	0.08	3.0	60	0	4.32	0.53	0.052
							10	—	—	0.007
							15	—	—	0.004
							20	4.34	0.53	0.004

cases, even with initial contents as large as 0.2 per cent. Within less than five minutes of revolving, the sulphur content was mostly well below 0.05 per cent., and a further reduction to about 0.01 per cent. could be obtained by more prolonged revolving of the ladle (which contained more than two tons of molten iron). Lime additions varied from 1.5 to 2.4 per cent. of the weight of the cast iron, and small quantities of coke dust were added to the lime in order to maintain good reducing conditions (this is unnecessary for routine foundry practice). Some of the experimental melts had minute additions of soda ash, to prevent lime sticking to the ladle wall and to reduce the loss of iron droplets

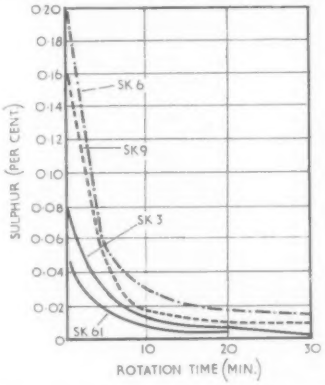

FIG. 3.—*Graph showing the degree of desulphurization obtained with the revolving ladle (see also Table 1).*

occluded in the lime powder. The iron temperature was about 1,250 deg. C. The loss of temperature had to be taken into account, but as the revolving ladle was well insulated the drop in temperature, for a comparable degree of desulphurization, was less than that to be expected when desulphurizing with lime in a rotary furnace. Another noteworthy feature was that the desulphurization of the liquid iron was just as effective whether the silicon content was low or normal. In a further experiment the final silicon content of the iron was only 0.02 per cent. Si—in this case the main reducing agent must have been the carbon.

Carburizing and Alloying

When using an ordinary ladle, the carburization of molten iron can only be carried out with great difficulty and with very doubtful results. It is, however, possible to carburize molten iron in a rotary furnace by intensive mixing of the iron with solid carbon, *e.g.*, coke breeze[3]. The revolving ladle has proved to be very suitable for the carburization of molten pig-iron without prior refining. Coke breeze, coke dust or ground graphite-electrode scrap can be used. Table 2 shows the results of some of the carburizing experiments when ferrosilicon and ferromanganese were added simultaneously. Provided that the temperature of the molten iron is not too high, one can expect a carbon yield of about 80 per cent. The specific heat and the heat required for dissolving the carbon being each about 5,500 k.cal. per ton and per 1-per cent. carbon, one has to expect a temperature loss of at least 80 deg. C. per 1 per cent. C when using a coke with 80 per cent. C, and when a carbon yield of 80 per cent. is obtained. Because the temperature of the iron must be kept high for this reason, it is possible to blow a small amount of oxygen into the molten iron during the processes of carburizing and alloying. But in this case one has to replace a certain amount of C and Si, and the conditions for subsequent desulphurization become less favourable. For alloying purposes in the revolving ladle (see Table 2) only ferrosilicon (45 per cent. Si) and ferromanganese (80 per cent. Mn) were used, but ferrosilicon (75 per cent. Si) would be better, since it is exothermic. The yield of Si and Mn was 90 to 100 per cent. of the quantity added. As will be shown later, it can be very useful to be able to adjust the C, Si and Mn contents of the liquid iron in such a simple way.

TABLE 2.—*Results obtained from Carburization and Alloying of Pig-iron in a Revolving Ladle (the Ferro-silicon and Ferro-manganese were added simultaneously).*

Experiment No.	Pig-iron (tons).	Additions (lb.).			Time.	Temperature.	Composition (per cent.).			Yield (per cent.).			Remarks.
		Coke.	FeSi, 45 per cent.	FeMn, 80 per cent.	(min.).	(deg. C.).	C.	Si.	Mn.	C.	Si.	Mn.	
1	2.3	100	130	45	0		2.70	0.22	0.04				
					2		2.94	1.38	0.71				
					4		3.34	1.34	0.71				
					9	1,280	3.48	1.33	0.70	64	101	100	Excess coke
2	2.87	130	260	45	0		3.28	0.43	0.37				
					10	1,255	3.89	2.07	0.93	57	95	112	Excess coke
3	2.66	55	220	45	0		3.72	0.72	0.43				
					10		3.78	2.35	0.93	—	103	90	Excess coke
4	2.84	22	27	—	0	1,310	3.50	0.25	—	84	80	—	
					5	1,250	3.72	0.40	—				
5	2.69	—	290	—	0	1,340	4.30	0.46	—				
					5	1,285	3.98	2.33	—	—	91	—	Kish formed
6	2.82	—	280	—	0	1,285	3.98	2.33	—				
					5	1,265	3.43	4.22	—	—	104	—	Kish formed

Eccentrically-revolving Ladle

Refining of Basic Bessemer Pig-iron

The revolving ladle is also very suitable for reducing or eliminating the Si and V contents of basic Bessemer pig-iron. This can be done, with the ladle at a standstill, by blowing oxygen into the molten iron with the aid of a lance injector. But as the depth of the metal in the bath is considerable, the silicon content remains much higher near the bottom of the ladle than further up—this has the effect of partly removing carbon as well. An attempt has been made to counteract this disadvantage by pre-refining during the filling period of the ladle[4]. The intensity of bath movement created by the revolving ladle makes it possible to carry out such pre-refining with great accuracy. For these experiments an exhaust-gas hood was put on the revolving ladle, as shown in Fig. 4, and a water-cooled lance injector supplied oxygen close to the bath surface. Details of three experiments can be seen in Table 3, and the results are shown in Fig. 5. It will be noticed that the loss of carbon is not considerable, except in experiment SF 1, when the temperature rose to 1,545 deg. C., although the silicon content was brought down from well over 1 per cent. to less than 0.1 per cent. (See experiment SF 4 on Table 3.) The carbon content fell only from 3.5 to 3.3 per cent., whereas silicon was reduced from 1.33 to 0.05 per cent. In experiment SF 1, so much lime was added that the slag formed had a basicity of $\frac{CaO}{SiO_2} = 1$; consequently the slag retained only 3 to 4 per cent. FeO. The other two experimental melts worked with a very acid slag, and the FeO content of the slag rose in the average to about 33 per cent. In these experiments the calculated oxygen yield for the oxidation of silicon was relatively low, about 30 per cent., but a much higher yield can be expected when some of the influencing factors are clarified, such as: The height of the end of the lance above the bath; the angle between the oxygen stream and the

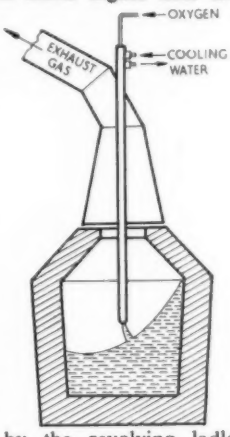

FIG. 4.—*Exhaust hood and water-cooled oxygen lance in position above the bath.*

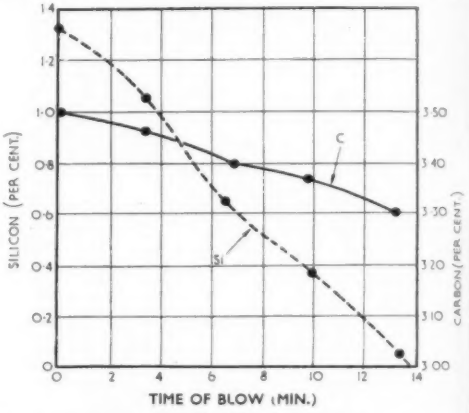

FIG. 5.—*Graph of some of the results set out in Table 3 (pre-refining of basic Bessemer pig-iron).*

TABLE 3.—*Results of Three Experiments on Pre-refining of Basic Bessemer Pig-iron in a Revolving Ladle.*

Experiment No.	Pig-iron (tons).	Slick or sintered pellets (lb. per ton).	Lime (lb. per ton).	Oxygen (cub. ft. per ton).	Time (min.).	Temperature (deg. C.).	Composition (per cent.). Pig-iron. C	Si	Mn	Composition (per cent.). Slag. FeO	SiO_2	CaO
SF 1	2.3	—	—	—	0	1,280	3.60	1.29	0.70	—	—	—
		—	50	170	3	—	3.60	1.16	0.70	4.4	41.8	40.8
		—	50	180	6	1,445	3.46	0.92	0.70	4.6	34.1	48.5
		11	50	325	11	—	3.24	0.41	0.65	2.3	41.0	42.1
		—	50	385	16	1,545	3.00	0.03	0.40	3.1	39.6	40.3
		11	200	1,060	16							
SF 3	2.05	—	—	—	0	1,260	3.52	1.11	0.87	—	—	—
		—	—	180	3	—	3.48	1.06	0.82	35.6	34.8	6.9
		—	—	130	5	1,290	3.52	0.99	0.76	43.6	32.9	—
		22	—	180	8	1,410	3.50	0.62	0.49	35.2	38.9	—
		22	11	180	11	1,375	3.44	0.31	0.26	36.5	34.6	—
		22	—	165	13	1,440	3.36	0.09	0.09	31.6	32.3	4.5
		66	11	835	13							
SF 4	2.1	—	—	—	0	—	3.50	1.33	0.44	—	—	—
		—	—	220	3.3	1,350	3.47	1.07	0.77	33.9	41.5	1.8
		22	11	220	6.6	1,410	3.40	0.65	0.50	23.0	41.6	10.9
		34	11	210	9.8	1,460	3.36	0.37	0.31	33.4	36.4	8.4
		44	—	200	12.9	1,430	3.30	0.05	0.09	35.2	35.6	7.6
		100	22	850	12.9							

furnace axis; the oxygen quantity per minute; the eccentricity, and the r.p.m.

Removal of Vanadium

Fig. 6 shows the results of experiments to remove high vanadium contents in basic Bessemer pig-iron. Additions of 2.3 per cent. slick (71 per cent. Fe) and of 0.3 per cent. burnt lime assisted in keeping the temperature of the molten iron between 1,200 and 1,250 deg. C.; alternatively, cooling was effected by gradually adding further quantities of cold pig-iron of the same initial composition. Altogether, 29.5 per cent. cold pig-iron was added, sufficient to prevent the temperature from rising beyond 1,300 deg. C. Fig. 6 also shows that no carbon was lost, even when silicon and vanadium were nearly completely removed. The vanadium content in the slag varied between 4.6 and 8.7 per cent.

Ladle Design

Fig. 7 shows the design of the experimental plant used at the Domnarfvet Research Centre. A lower table *A* can be rotated by means of a crown wheel and a bearing *B*. A round plate *C* is mounted on the table, more or less eccentrically, say at a distance *a*. The ladle itself stands on a round plate *D*, which could, supported by rollers, revolve concentrically about bearing *E*, were it not held firmly at point *F*. It thus swings about this point *F* when the table revolves. The movement of the ladle centre will therefore be a circular one, but, as the ladle support plate is held at point *F*, all other points will describe elliptical paths. This was the original layout, but it was hoped to find a better design later on, so that every point of the ladle support plate would describe a circle. From the point of view of producing an undulating movement, and thus a good mixing, it is of little

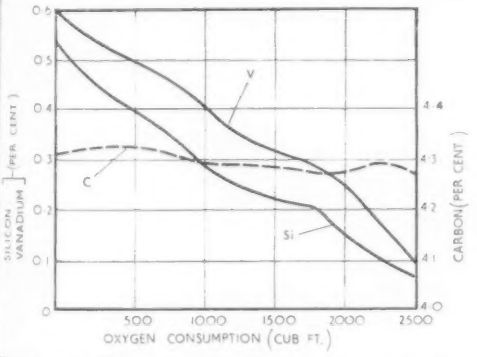

FIG. 6.—*Results of experiments to remove high vanadium contents from basic Bessemer pig-iron.*

importance in which way this movement is brought about. The best solution discovered so far is that of the Gesellschaft für Hüttenwerksanlagen m.b.H., Düsseldorf, as shown in Fig. 8. The ladle no longer stands on a pivot table, but is inserted into a triangular frame resting on ball-bearings. The required movement is ensured by a parallel motion guide, and eccentricity and r.p.m. can easily be adjusted.

In order to facilitate pouring of the pig-iron after treatment, a pouring spout is placed in the nose of

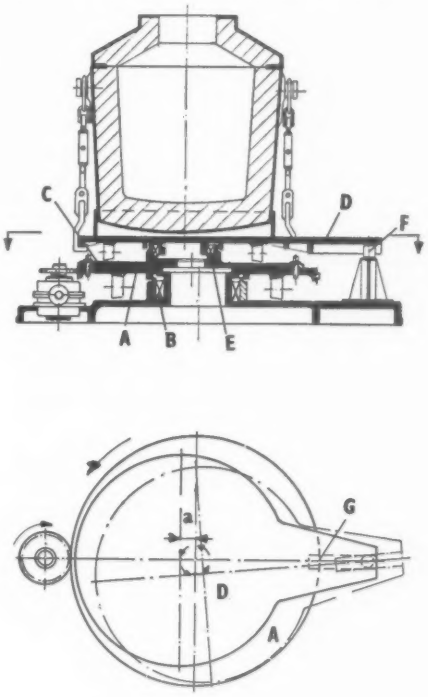

FIG. 7.—*Design of the experimental plant used at Domnarfvet Research Centre.*

KEY: A—Lower table; B—crown wheel and bearing; C—round plate mounted on the table; D—round plate on which the ladle stands, and E—bearing about which D could revolve concentrically were it not held firmly at F, the pivot.

the ladle (Fig. 9). By this means it is possible to prevent the powdered lime from flowing out with the iron, and pouring can take place from the ladle directly into a casting machine or moulds. During treatment the pouring spout is blocked with a stopper. After tapping the iron, the ladle is placed vertically with the mouth downwards to tap off the lime powder.

Ease of Handling

One of the most important advantages of the revolving ladle is the simplicity of its handling in practical shopwork; normal ladles can be used, provided that they are equipped with a conical lid. This lid is necessary when desulphurizing pig-iron, in order to maintain good reducing conditions and to collect the brown smoke caused when refining with oxygen. The ladle can be filled up to two-thirds of its height. The maximum height of the bath wave during revolving can be taken as 1.4 to

Eccentrically-revolving Ladle

1.6 times the height of the bath when at a standstill. The ladle can be well insulated, which is an additional advantage over a horizontally-built and fast-revolving rotary furnace—heavy insulation of such a rotary furnace would create additional mechanical stresses, on account of the increased weight to be rotated. A revolving ladle can also be built much smaller than a rotary furnace for the same charge capacity. Whereas a rotary furnace requires 0.55 to 0.65 cub. yd. of space per ton of iron, a revolving ladle only needs half of this volume, and therefore requires a much smaller capital investment.

Large-scale Production

Desulphurization of molten iron with lime in a rotary furnace has not yet found such wide application as one might expect, in view of the results obtainable by this method. Since the introduction of the revolving ladle, however, much more attention has been paid to the potential economic advantages of desulphurizing with lime. Revolving ladles with capacities of up to 80 tons of molten iron are under construction (Fig. 10). It is expected that the revolving ladle will be particularly useful to foundries desiring to improve the quality of their cast iron. As the same chemical analysis can be obtained by mixing in a revolving ladle, the charging of hematite pig-iron can be discontinued and steel scrap used instead, thus considerably reducing

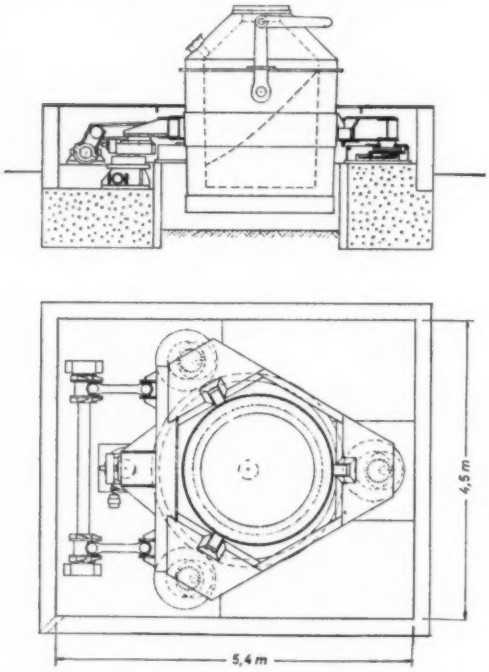

FIG. 8.—*Ladle-revolving system adopted by the German firm Gesellschaft für Hüttenwerksanlagen m.b.H., of Düsseldorf.*

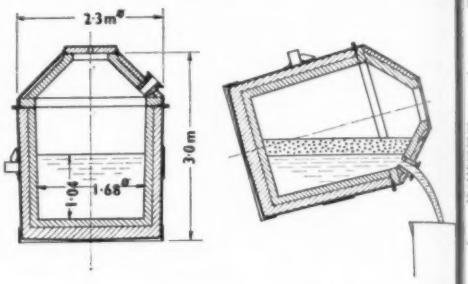

FIG. 9.—*Section view showing, in particular, the pouring spout in the nose of the ladle.*

the cost of the charge. The experiments carried out at the Domnarfvet Research Centre have proved beyond doubt that the necessary changes in the percentage composition of the iron can be achieved in the revolving ladle—chemical compositions before and after treatment were as follows:

	per cent.	
	Before	After
C	3.28	3.78
Si	0.43	2.05
Mn	0.37	0.91
S	0.059	0.006

Standard Charges

Not only can the required C, Si and Mn content be obtained with greater accuracy in the revolving ladle, but it is also possible to reduce the sulphur content to a figure which is lower than that obtainable in the basic hot-blast cupola, thus enhancing the casting quality of the iron. Many foundries find it necessary to change the compositions of their cupola charges several times during a shift, because several grades of cast iron have to be produced. When using a revolving ladle, the cupola can be charged with a standard mixture of the cheapest raw materials, and no changes on account of a required analysis of the castings have to be made on the charging platform.

Economic Advantages

The economic advantages of replacing the expensive pig-iron by steel scrap are shown in Table These comparative figures have been calclulated for a foundry producing 24,000 tons of ingot moulds per year, and are based on values relating to German production conditions. For the purpose of this translation, the DM have been converted into £ s. d. at a rate of 12 German marks to the pound sterling. The saving is seen to be £4 8s. 8d per ton.

TABLE 4.—*Comparison of the Costs of Normal Production, and Production using a Revolving Ladle.*

	Normal production.	With revolving ladle.
	(per cent.).	(per cent.).
Cupola charge		
Ingot-mould scrap	50	50
Hematite pig-iron	50	nil
Steel scrap	nil	50
	£ per ton.	£ per ton.
	£ s. d.	£ s. d.
10 cwt. ingot-mould scrap	Nominal	Nominal
10 cwt. hematite at £26 10s. per ton	13 5 0	—
10 cwt. steel scrap at £14 10s. per ton	—	7 5 0
25 lb. Fe Si (75 per cent.) at £72 per ton	—	0 16 1
7 lb. FeMn (78 per cent.) at £106 per ton	—	0 6 7
22 lb. coke breeze at £5 per ton ..	—	0 1 0
Total	£13 5 0	£8 8 8
Additional cost for the treatment in the revolving ladle		
44 lb. lime at £5 per ton	—	0 2 0
Wages	—	0 3 0
Power	—	0 0 2
Repairs and depreciation	—	0 2 6
Total	£13 5 0	£8 16 4

Results obtained with Pilot Plant

The first pilot plant, using a revolving ladle of three tons capacity, has been in actual production in Germany since 1958, and the results have been very interesting from the beginning. For example, 50-per cent. steel scrap and 50-per cent. ingot-mould scrap were charged into an acid-lined hot-blast cupola. When tapped, a white iron with 2.9 to 3.1 C, 0.6 Si and 0.17 per cent. S was obtained, to which, after transfer into the revolving ladle, small amounts of coke breeze and ferro-silicon were added. After 10 min. of revolving, a uniform grey iron with 3.9 C and 1.5-per cent. Si resulted. Fig. 11 (top) shows the spiral tests before and after treatment in the revolving ladle. In order to investigate the effect of subsequent desulphurizing on the casting quality of the iron, lime was added to the revolving ladle, and Fig. 11 (bottom) shows the spiral tests of samples taken before and after such treatment. Despite a temperature loss in the revolving ladle of about 60 to 80 deg. C., the iron ran better than before the treatment, on account of the lower sulphur content.

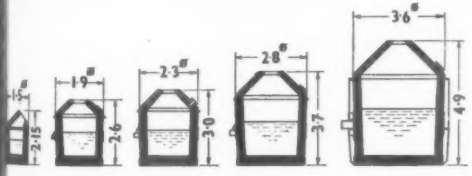

FIG. 10.—*Weight and dimensions of various sizes of revolving ladle; (a) steel capacity, and (b) ladle weight, including lining.*

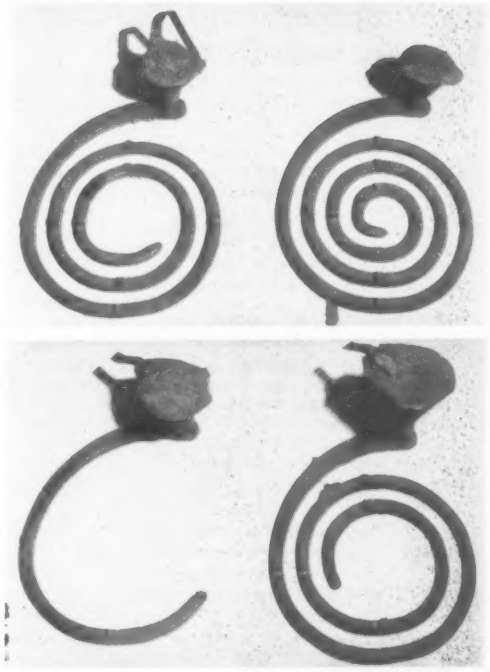

FIG. 11.—*Fluidity spirals of iron before (left), and after, treatment in the pilot plant. The upper photographs are of metal treated for* 10 *min. with coke breeze and ferro-silicon; the lower spirals were obtained after the metal in the ladle had been subsequently desulphurized with lime.*

Conclusion

It is possible that further fields for the use of a revolving ladle will be found, wherever the mixing of molten metals or of metals requiring additional materials may be required, or in the desulphurization of pig-iron before transferring it to Bessemer converters, in steelfoundries.

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[3] R. J. Higgins and J. C. Billington, BCIRA *Journal Res. & Dev.* (1958), **7**, 171 to 187.
[4] J. L. Harrison, *Journal* Iron and Steel Inst. (1958), **191**, 328 to 336.

Stewarts and Lloyds to close Clyde Works

About 200 men will be affected by the closing by Stewarts and Lloyds, Limited, of its Clyde works, one of the company's three undertakings in Coatbridge (Lanarkshire). Alternative employment is being sought for the men in other Scottish works belonging to the firm, and in cases of direct redundancy financial compensation, based on length of service, will be considered.

It was stated that the only alternative to closing the 100-year-old works would be costly and extensive rebuilding.

Equipment and Supplies

Twin-table Shotblast Unit

A new extra-large Pangborn-designed shotblast plant, claimed to be particularly suited to the needs of heavy jobbing foundries, is now being manufactured by Hepburn Conveyor Company, Limited, Rosa Works, Wakefield. This is known as the 8-ft. twin-table Rotoblast, and is considered to offer several major improvements over similar earlier, but smaller, models. With the new machine, the actual cleaning is carried out by two Rotoblast wheels, driven by 30-h.p. motors, which are designed to throw 45 tons of abrasive per hour and provide faster treatment than other models. The machine is capable of cleaning individual castings of up to 8 ft. dia. by 3 ft. 6 in. high, and work-loads totalling up to 4½ tons (see Fig. 1).

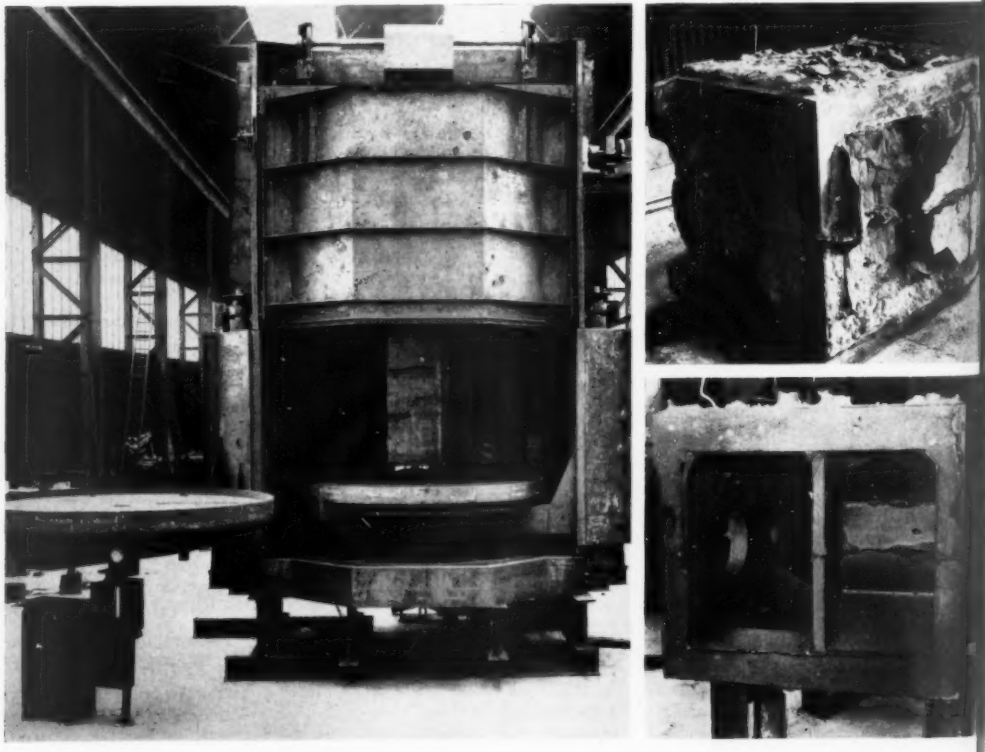
Other Features

Operation of the two work-tables follows normal practice, one being outside the cabinet for loading, turning or unloading castings, while the other is inside the machine, where its load of castings is being cleaned. The work-tables swing on columns with dust-sealed roller-bearings top and bottom. The cabinet itself is 10 ft. wide by 9 ft. 6 in. deep, 8 ft. 2 in. high inside, and has an electrically-operated vertical-lift door. The inside of the door is lined with ¼-in. rubber sheeting and the blast area is protected by a special wear-resisting alloy. During blasting operations, the abrasive is cleaned and continuously re-cycled. Other features claimed for the unit are: Support of the work-tables on main columns consisting of built-up beams, to distribute the load; provision of supports under the tables in the loading position, and an air-lock clamp which locks the table inside the cabinet. This clamp, when released, "kicks" the table out of the cabinet, so that the operator has only to walk with the table to keep it moving until latched in the "out" position.

Plate-thickness Gauge: Electronics Manufacture Export Company, 127, Grace Street, Plainview, L New York, announce that they are now marketing t Dyna-Empire thickness gauge, which is claimed provide a rapid and simple means of determini the thickness (to 1/10,000 of an in.) of a plated painted surface on a ferrous-base material.

Hose Fittings. Hozelock, Limited, Haddenha Bucks, announce that they have acquired the s manufacturing and selling rights of the hose fitti previously manufactured by the engineering division Airtech, Limited.

FIG. 1.—*Twin-table (Pangborn design) heavy-duty shotblast plant in course of construction at the wor of Hepburn Conveyor Company, Limited—note the table-support in the left foreground, a second (n shown) being provided to support the other table on the right-hand side. Inset are before-and-af pictures of a sizeable casting treated in the plant.*



Clean Air Act, 1956

By "Barrister-at-Law"

The writer explains the general aspects of the Clean Air Act, 1956, by dividing them into four sections, namely: Emission of dark smoke; emission of grit and dust; smoke-control areas, and smoke nuisance. The powers given to local authorities by the provisions of the Act, and the defences available to persons accused, are all dealt with in detail.

The provisions of the Clean Air Act, 1956, fall into four divisions, the first division (contained in sections 1 and 2) dealing with the emission of *dark* smoke from chimneys. These provisions came into operation on June 1, 1958. The second division (contained in sections 5-10 of the Act) deals with the emission of grit and dust from furnaces. Section 10 (which prescribes the height of chimneys for new buildings) has been in operation since December 31, 1956. The other provisions with regard to smoke and grit (sections 5-9) were brought into operation on June 1, 1958, at the same time as the provisions dealing with *dark* smoke. The third division (contained in sections 11-15) deals with smoke-control areas, *i.e.*, areas in which the emission of *any* smoke at all, not merely dark smoke, from chimneys is prohibited. Whether these provisions are in operation in any particular area will depend on whether the local authority for the area has passed a Smoke Control Order, and whether the order has been confirmed by the Minister. There is a certain flexibility with regard to these orders. They may apply to the whole area, which would then have to be completely smokeless, or they may apply only to certain classes of building. Again, even if they apply to the whole area, exceptions may still be made for certain buildings.

There is a further section (16) of the Act which deals with smoke nuisance, apart from the specific prohibitions against the emission of *dark* smoke, or of *any* smoke in smoke-control areas. This section provides, in substance, that if a nuisance is caused by the emission of smoke in any other way, then the emission is to be regarded as a statutory nuisance for the purpose of the Public Health Act, 1936, so that the nuisance can be dealt with by the local authority in a summary manner, by legal proceedings or otherwise. The provisions of this section are aimed at cases such as the creation of smoke from the burning of waste materials in the open, or the emission of smoke, other than *dark* smoke, from the chimneys of commercial buildings.

The different aspects of the Act will be dealt with briefly in what follows:—

Dark Smoke

The emission of *dark* smoke from a chimney is prohibited. Any opening or structure through, or from which, smoke may be emitted constitutes a chimney for this purpose—thus, louvres in the roofs of buildings would constitute a chimney. The chimney, moreover, may be structurally separate from the building which it serves; and it may serve outdoor boilers or industrial plants attached to buildings. On each day on which dark smoke is emitted, a separate offence is committed. The occupier of the building or the person in possession of the boiler or industrial plant is held responsible.

Exemptions

Certain exemptions are conferred by the Dark Smoke (Permitted Periods) Regulations, 1958 (S.I. 1958, No. 498), principally where such emissions are unavoidable (due, for instance, to soot blowing or clearing). In general, dark smoke may not be emitted from a chimney for more than 10 minutes over a period of eight hours, nor for more than two minutes over a period of 30 minutes, the time being extended to 14 minutes per eight hours if soot blowing is being carried out. If a chimney serves more than one furnace, these times are extended. The maximum continuous emission, however, is limited to four minutes.

Defences

The Act allows certain defences to be raised, as, for example, where the emission is due to lighting-up from cold, or some failure of the furnace or apparatus, or to the use of unsuitable fuel where proper fuel is unobtainable. There is, moreover, the seven-year period of grace till July 4, 1963, during which period it will be a defence if the emission is due to the nature of the building or its equipment, and the necessary alteration or equipment of the building has not been practicable in the meantime. Certificates to this effect may be obtained from the local authority. However, careless or improper use of plant, or bad stoking, which causes black smoke will not be recognized as defences.

Grit and Dust

The avoidance of emission of grit and dust may not be as practicable as the emission of black smoke. Accordingly, the law is not quite as severe. The operator is required to use all practicable means to minimize such emissions from chimneys or furnaces burning solid fuel or solid waste. This applies equally to ovens and any form of retort or container used for the subjection of solid fuel to any heat process. For the above purposes, means will be regarded as "practicable" if they are reasonable having regard, *inter alia*, to local conditions and circumstances, and to financial implications and the current state of technical knowledge. In this connection the provision, maintenance and proper use of plant will be taken into account. It is also obligatory for all new furnaces which burn pulverized fuel or large quantities of any solid fuel

Clean Air Act, 1956

or waste, and all *new* ovens which process solid fuel, to be fitted with efficient grit- and dust-arresting plant which, moreover, must be to the local authority's satisfaction. Similar approved arresting plant must also be fitted to furnaces burning pulverized fuel or solid fuel in any other form, or solid waste *at a rate of one ton or more per hour*, and also to ovens which are used to subject solid fuel to any process involving the application of heat. There is a right to appeal to the Minister if the authority fail to give their approval.

Smoke-control Areas

As stated above, it will be up to each local authority to determine whether it should declare an area to be a smoke-control area, and the degree to which this should be so. For this purpose the authority must make an Order. The procedure in general will be the same as in the case of other Orders made by local authorities. Due notice of the proposal will be advertised, and objections to the proposed order can be raised. Outstanding objections will be referred to the inspectors holding the local enquiry, who will report in turn to the Minister. The order will only become operative upon confirmation by the Minister. In areas where such an order operates, the emission of *any* smoke will in general be an offence, punishable by a fine of up to £10 per day. It will be a defence, however, to prove that the smoke was not caused by the use of any fuel other than that authorized. The authorized fuels are defined by the Authorized Fuels Regulations, 1956, and include coke, anthracite, low-volatile steam-coals, coalite, phurnacite, Rexco, gas and electricity. In premises within such areas, all necessary alterations to grates and appliances must be effected.

Smoke Nuisance

Finally, nuisance caused by smoke in circumstances which are not subject to the express control of the Act, *i.e.* smoke other than black smoke, and smoke emitted in a non-smoke-control-area, is now dealt with. If the emission of smoke in such cases amounts to a nuisance to the inhabitants of the neighbourhood, special powers are conferred on the authority by S.16 of the Act to deal with such nuisances in a summary fashion. The authority may serve an abatement notice, requiring the nuisance to be abated within a specified time; in default, it may institute proceedings in a police court, whereupon the offender may be fined. It is to be observed, however, that it would be a defence in the case of smoke *emitted from a chimney*, as distinct from smoke caused by burning in the open, for instance, to prove that the best practicable means had been employed to prevent the nuisance. A further new power which is conferred on local authorities in such cases is the power to apply to a police court, without serving any prior abatement notice, for an order directing the person by reason of whose act, default, or sufferance the nuisance arose, to prevent a recurrence of the nuisance, and further to execute any works necessary to prevent any such recurrence within a specified time.

Old Foundry Records

Old documents and records, some dating back more than 300 years, were found during the recent reorganization of foundry and office accommodation at the Springfield Steel Company, Limited, Glasgow. They have proved so interesting that the company has decided to incorporate them in a history of the iron and steel industry of Scotland.

The earliest recorded date is 1607, when Sir George Hay founded the Fassagh Ironworks on the shores of Loch Maree, using the vast oak forests at Letterewe as a fuel supply. Three years later King James VI granted him a patent for the manufacture of iron in Scotland. When, after a further 11 years, the fuel supply had presumably diminished, there was a patent registering "the misterie and arte of melting iron ewre and of making the same into cast works or barres with sea or pit coals in furnaces with bellows." This apparently marked the turning point of the industry in Scotland.

To increase the scope of the intended publication, Mr. Robert MacLeish, the company's public relations officer, would like to borrow any documents, letters, or pictures dealing with the Springfield Steel Company during the years 1870 to 1918. He would particularly like to find out why the foundry, standing at the junction of Springfield Road and London Road, is known locally as the "Pancake." Anyone with such information or documents, etc., who would be prepared to lend them for photographic copying is invited to notify Mr. MacLeish, at the Springfield Steel Company, Limited, 1323, London Road, Glasgow, E.1.

R T & B Spencer Steelworks

That an era of prosperity would be brought to Monmouthshire by the new steelworks of Richard Thomas & Baldwins, Limited, now being built at Llanwern, was the opinion expressed recently by Mr. Henry F. Spencer, managing director of the company. Mr. Spencer, who has given his name to the works, told parents and pupils of St. Julian's High School, Llanwern, that the works would become a "national monument in prosperity and efficiency."

He went on: "I prophesy that this magnificent plant will by its own vitality, originality, and sensitivity to the future technical changes in the iron and steel industry, stimulate an increasing demand for its products, necessitating progressive and continuing expansion."

Mr. W. O. Campbell Adamson, general manager of the new works, said at a recent meeting of the Newport and Monmouthshire branch of the British Institute of Management that most of the 5,500 men who would start work there next year would be inexperienced. "We would like as much of the labour as possible to be 'green'—inexperienced men without pre-conceived ideas," he said.

There would, however, be a small number of key-men from other plants, taken on in advance of the main labour force, which they would help to train. Mr. Campbell Adamson described the selection of the management team as "a nightmarish task." Although its members would all be experienced, they would not have worked in such a highly automatic plant before. A new wage structure would have to be formulated for the men working there, he said.

National and Midland Ironfounders' Association

Report on Annual General Meeting held in Birmingham

The annual general meeting of the National and Midland Ironfounders' Association was held recently at the Midland Hotel, Birmingham, following a luncheon over which Mr. W. James (chairman of the Association), presided. After the apologies for absence and the minutes of the annual general meeting held in 1959, Mr. James delivered his Report, in the course of which he said that since the Association met in March of last year and heard the report of the chairman, Mr. W. H. Thursfield—now the president, there had been a somewhat unexpected boom in trade in which the ironfoundry industry had benefited to some extent. He then went on to comment on the figures for the industries performance over the year (which have previously been detailed in this JOURNAL*).

Discussing employment, he said there might be some significance in the figures especially when it is realized that in 1950, with a percentage production of 93.1 against the 1954 year of 100, the total employment was 148,000 whereas in the third quarter of last year, when the percentage of production was almost identical with that of 1950, the number employed fell to 124,000. This might very well be explained by developments in mechanization and in addition an intensive drive by foundry management to obtain, by improved methods and modern techniques, a greater output per man employed in their foundries. There had been a steady improvement in working conditions although even at the present time there were quite a number of foundries which had not reached what should be regarded as a minimum standard. Yet, the conditions of work and the amenities provided were far in advance of what was regarded as satisfactory at the outbreak of war.

Closures

During the 10 years from 1950 to 1959, Mr. James said, no fewer than 370 iron foundries had been closed and although it was possible that some listed under the term iron foundries included malleable, the majority no doubt related to foundries producing grey-iron castings. The rate of closure was also interesting, from 1950 to 1953, 75 foundries ceased to operate, from 1954 to 1956, 157 foundries, and for the three years 1957, 1958 and 1959 the number of foundries going out of production amounted to 166. The reasons for closing were not always easy to establish but there were at least three chief reasons.

Probably the main reason for the closing of many of the small foundries was the high capital expenditure which would be incurred in bringing the foundries up to date and installing the amenity schemes which are now required. Another reason might very well be the unprofitable nature of the foundry industry, generally, especially during the somewhat depressing trade conditions of the last few years. A third reason was the action of many of the engineering concerns which had found it more profitable and much more convenient to close their own foundries and to purchase their requirements from other foundries which specialized in the type of castings they require.

*See "Iron Castings Production," JOURNAL, March 3; employment figures, March 10, and Leader, March 17, "UK Foundry Production in 1959."

Change of Structure

It would be wrong, said Mr. James, to draw the conclusion from the foregoing facts and figures that the production of iron castings in the future would be concentrated within the limits of a few very large concerns but it did mean that there was being created what might be described as a minimum-size unit, varying in some way according to the type of products made but large enough to ensure the highest possible standards of working conditions and capable of taking advantage of all technological advancements which had been already made and were forseeable in the future. In all these changes, official and otherwise, the foundry associations had played a very big part and the National and Midland Association, especially through membership of the Council of Ironfoundry Associations had been able to contribute valuable information and advice in guiding the industry.

Training

The foundry industry might be described as having a four-dimensioned structure, *i.e.*, of labour, pig-iron, coke, and scrap and during the period covered by this report all four seemed to have been in satisfactory balance. No reports had been received of any very great difficulties in obtaining a sufficient supply of labour—if one excepted the usual and almost permanent shortage of really skilled men—and although this might be the case, it was well to bear in mind the steps which were being taken by the industry itself to remedy this position. The Association had contributed very greatly to the various schemes which were now in operation for the training of foundry personnel—schemes which applied so far as it was practicable to advance knowledge and skill of operators who worked on the foundry floor. Various other schemes were in existence for giving both technical and technological training, and very valuable work was already being done by the National Foundry College, at Wolverhampton, of which the Association's guest speaker, Sir Frederick Scopes, was chairman of the Governors.

Although the Foundry College had only been in existence since the war, it had served a very useful purpose and the Governors had now decided to extend the scope of operation of the College by creating an additional course of a higher standard than was originally intended or foreseen. By these various means the standard of training and academic qualifications of foundry personnel generally has been very greatly enhanced.

NMIA Annual General Meeting

Pig-iron and Coke

There had been very few difficulties if any, over the year, in obtaining a sufficient quantity of pig-iron, in fact during one period the supply of pig-iron, particularly the high-phosphorus type was causing some embarrassment to producers because of the building up of very large stocks.

The quantity of foundry coke which had been produced by the National Coal Board had also been of sufficient volume to meet the requirements of the foundry industry and although there did occur a certain dislocation due to the closing down of ovens in the North of England and the development of a substitute source in South Wales, the supply position has been quite satisfactory and had caused no very great difficulties. In connection with the transport of coke from the South Wales ovens, there had arisen some little "storm in a tea-cup" over the question of the charges which were being made by the National Coal Board when coke was carried in road vehicles in preference to transit by British Railways. This had engaged the attention of the Association's executive and would continue to do so whenever it was in the interest of the members of the Association to reopen the matter with the National Coal Board.

Scrap Position

In considering the position of scrap, Mr. James continued, the supply position had, generally speaking, been satisfactory, although there had been, and might very well continue to be, a shortage of the very best qualities of cast-iron scrap. It was doubtful whether the position of the law of supply and demand for this particular quality would ever reach equilibrium; many foundrymen had come to the conclusion that the cheapest-ever scrap iron was always the best to use.

There had been many contacts through the CFA with the Government department concerned relating to the vexed question of the export of scrap and it might be taken as a tribute to the influence of the CFA that the views of the ironfoundry industry had had some bearing on the decision made by the Ministry concerned with this particular matter. It was stated some time ago that there were likely to be very large arisings of cast-iron scrap following upon the concentration scheme put into operation for the textile industry and some rather fantastic figures had been quoted for the probable quantity of cast-iron scrap which would be available. Experience had shown that the amount was very much less than forecast. It was possible that the scrap-iron trade was purposely regulating the quantity which they had for disposal in order to avoid a serious drop in the price, and if this were the case, the Chairman considered such a policy should receive members' approval so long as they were not compelled to pay an unreasonable figure. A glut served no very useful purpose in the long run and what was required was a steady and adequate supply of quality materials at a reasonable price.

Price Differential

The price question was, however, a matter which needed a little further consideration, Mr. James went on to say. The differential between the price of cast-iron scrap and the price of pig-iron was higher than it had ever been at any time and it had been suggested by an eminent member of the ironfoundry industry that it would cause no surprise if the price of scrap iron were to rise considerably, especially if the demand from at least one section of the industry continued to expand, and the supply of machinery scrap from the discontinued cotton-mill machinery was not large enough to bridge the gap between availability and consumption. The best advice which could be given here was for all foundries to purchase as much as they could accommodate, bearing in mind storage facilities and their financial resources. By doing so, they would avoid the possibility of any further approach by the scrap trade for permission to export cast-iron scrap. In addition to this, such action would support the efforts of both the CFA and the Association in persuading the Government department concerned, that the ironfoundry industry could use all cast-iron scrap which was available.

Publicity

It was fitting at this juncture to review the activities of the Association's executive commitee. Two matters which had been under discussion and which were in many ways related, were regarded as of the highest importance, namely, publicity and development. The publicity undertaken by the executive was on a local basis and intended to convey information to both members and non-members of the advantages to be gained by becoming members of an Association, where their interests could be safeguarded and where advice could be given on the numerous matters which related to the running of ironfoundries. A publicity sub-committee had been appointed under the chairmanship of Mr. E. C. Marsland whose keen interest in this matter, together with the support of other members of the committee, had produced some very good results. It was now the intention of the executive to extend the work of publicity beyond the confines of the Association and to attempt to reach all parts of the UK and to supply information concerning the merits of iron castings.

The executive had been encouraged to take this course in view of the fact that the CFA had been unable to take any strong lines in this direction owing to the differing interests of the various associations within its membership. The executive had also been encouraged in their actions in this direction by an unofficial approach made to them by members of other associations, who had come to the same conclusion, namely that wise, general and also specific action was required in the interests of the industry generally.

At present, no more than an unofficial contact existed, but the Chairman said he felt sure that the executive would have the approval of the members of the Association in continuing its activities in this

direction and to take any action in co-operation with other associations which would increase, or at least maintain, the demand for iron castings. In spite of the general increase of production in metals of all kinds, the ironfoundry industry appeared to have difficulty in maintaining the output figures of 1954 and this was specially clear when compared with the production of steel. One might assume that the production of iron castings would more or less keep pace with the production of steel, but this was far from being the case and, in fact, had it not been for the very heavy demands of the motor trade, the total production of iron castings would have been less satisfactory.

Development Committee

Not only had ironfounders to face competition from steel as a substitute for iron, but no doubt there were certain other commodities which were making substantial inroads on the established uses of iron castings and it was for this purpose that a Development Committee had been formed. Very few details were known at present of what direction the suggested development publicity should take as much would depend upon the support to be obtained from the industry generally. The question of the financing of this venture would be a matter for consideration and members would be kept fully informed on this project.

In addition to the ordinary meetings of the executive representatives attended meetings held by the CFA., where the Association was represented by Mr. E. C. Marsland and Mr. A. C. Jones. Mr. J. E. Spear was a member of the Education, Recruitment and Training Committee of the CFA, and Mr. W. F. Trafford was now a member of the CFA Safety Committee and had taken the place of Mr. Paul Rice who was formerly the Association's representative. Mr. Rice had been a most active member of this Committee for some time and thanks were due to him for the interest he had always taken.

Costs

There was also a Joint Fact-finding Committee working with the National Federation of Engineering and General Ironfounders and on this the Association was represented by Mr. E. Hunter and Mr. F. Timmins. This joint venture between the two Associations would act in the best interests of the industry and it might be possible to extend the co-operation now taking place so that other problems common to the industry could be considered in friendly co-operation. The focus of attention by the fact-finding Committee had now moved a little away from the question of selling prices and was directed more intensively to the question of costs, a change in which the executive was in complete agreement.

It was regretted that in many foundries—and not always the smaller ones—costing was regarded more as a nuisance than a necessity, but it was only by means of accurate costing and estimating that the level of prices appropriate to the selling price of a particular article could be fixed. Although costs would always vary slightly from foundry to foundry (as they might very well do in other industries), the differences between one foundry and another should not be very large. In any case, if an order were accepted below cost it was always desirable to know how much money was being lost on the transaction.

Change of Secretary

As all members would be aware, there had been a change in the Association's secretariat, following as a consequence of the election of Mr. L. H. Cleaver as Conservative parliamentary member for the Yardley Division of Birmingham. It had been a very pleasant surprise to hear of his election and he took the opportunity, on behalf of members, of congratulating Mr. Cleaver publicly. In accepting Mr. Cleaver's resignation from the secretaryship of the Association, he thanked him for his services. Members would all watch with very great interest the progress he made as a Member of Parliament.

Following the resignation of Mr. Cleaver, a temporary appointment was made of Mr. F. W. Sims and even the short acquaintance members had had with Mr. Sims had very much impressed them. He had taken a very great interest in the work of the Association and had closely co-operated with the members of the executive in carrying on the work. At the last meeting of the Executive, Mr. Sims was appointed secretary of the Association under Rule 15 of the Constitution and on the same terms and conditions as those applying to Mr. Cleaver.

It was the suggestion of Mr. Sims that the Association should publish a quarterly bulletin or review and the first copy of this had already been sent to members. It was hoped to make this an effective and useful house organ of the Association, and to include from time to time not only general information, but also whenever possible certain short articles dealing with problems of special interest to the industry. The executive would also welcome suggestions from members whether they would like any particular items included and also any improvements which they could offer. It was also the intention to continue the quarterly meetings which had proved so very popular and to have addresses on subjects which were of importance to the industry. The next meeting would be addressed by Mr. H. Morrogh, director of the British Cast Iron Research Association.

Election of Officers

Following the chairman's report, it was announced that Mr. W. H. Thursfield, J.P., (Albion Foundry Company, Limited), had been elected president; Mr. W. James (Monmer Foundry, Limited), chairman, and Mr. E. Hunter (Court Works, Limited), deputy chairman of the Association. Newcomers to the executive committee were Mr. C. B. Griffiths (Incandescent Heat Company, Limited), Mr. E. J. Guthrie (General Electric Company, Limited), and Mr. P. Rice (Edward Matthews, Limited). Mr. J. E. Spear

NIMA Annual General Meeting

(John Harper & Company, Limited) and Mr. F. G. Timmins (George Clancey, Limited) were re-elected.

Address by Sir Frederick Scopes

Sir Frederick Scopes in the course of an address made to the Association following the conclusion of the formal business of the annual general meeting, dealt broadly with education in the foundry industry. By visiting the National Foundry Craft Training Centre, he said, the foundry foremen could familiarize themselves with the work being undertaken there. Also, a new approach should be made to the Ministry of Labour "Training within Industry" schemes. Foundry owners would benefit from sending senior staff to the courses and then on completion, these men would themselves explain the precepts to their foremen. Sir Frederick made a plea for the members of the NMIA to participate in the forthcoming Ironfounding Health and Safety Conference, organized by the CFA, which is to be held at Blackpool in April. He also commended to them the new three-year sandwich course arranged at the National Foundry College, as, he said, it had a "distinct part to play in offering your up-and-coming younger men an excellent technical training ground."

Referring to the British Cast Iron Research Association, he said, this body enjoyed an international reputation and offered a service which he considered to be virtually indispensable. Last year, the BCIRA introduced a new form of membership—Grade B—and for a very small fee (probably not more than 2½d. per man per week), assistance could be obtained on day-to-day or precise problems involving tests, experimental work and/or visits by the Association's staff. As costs rose—and rise they would with reduced working weeks and increased scrap prices—Sir Frederick said that the need for better methods, the latest equipment and a high degree of mechanization would become more pressing.

Ideas in Employee Welfare.

Continuing, Sir Frederick said that this era of the Welfare State was an opportunity for employers to encourage the better type of employees to assert themselves as persons and property owners, in a State which tended to smother everyone with its "cradle-to-the-grave" services. It was important that employees be able to achieve ownership of their own houses, and they should be encouraged by special schemes to help them to do so. He was following, with interest, the progress in Parliament of the Payment of Wages Bill, with its plan to enable works' employees to elect to be paid by cheque. Recently, a reference was made in the Press that at the Witton works of the Imperial Chemical Industries, Limited, more than a quarter of the works employees were now paid in this way, and this, he added, reflected the growth of the pay packet to dimensions which no longer made it the ideal arrangement for such sums to be passed over in a wages envelope. He also thought it indicated the possibility of people budgeting for longer terms than just a week, and offered the opportunity of changing the whole concept of living from week to week.

In his own company, Sir Frederick went on, they had been pleased to assist in arranging for the employees a private scheme of insurance, whereby they were able to obtain for themselves sick payments of up to £5 per week by paying a premium of some three shillings per week. These payments—plus State benefit—enabled employees to manage to maintain their standard of living in times of illness. The scheme had been taken up by about 25 per cent. of employees. Sir Frederick said these things would grow and employers should encourage them if the country was not to be permanently divided into two camps, of those who thought one system was right and those who thought the other. Perhaps, he concluded, these matters were imponderables, but he suggested they were worthy of consideration, even if they seemed somewhat removed from the daily task.

GEC Furnaces for Plutonium Metal Production

A further contract from the United Kingdom Atomic Energy Authority, Risley, for electric furnaces for use in the production of plutonium metal has been received by the General Electric Company, Limited. The latest order covers reduction and fluorination furnaces.

The fluorination furnace is rated at 10 kw. and is of the horizontal front-loading type, complete with muffles, the inner surface of the muffles and doors being lined with platinum. A forced cooling system is incorporated to enable the charge to be cooled within a stipulated time. The furnace for the reduction process is rated at 50 kw. It is of a bell-type design and has a forced cooling system similar to the fluorination furnace.

Electrical equipment being supplied includes regulating transformers, temperature control-gear and the necessary switchgear.

Electric Transporters in New P & O Liner

Two specially designed transporters for loading and unloading cargo in the new P & O liner Canberra are being made by the Carron Company, of Falkirk. The hoisting and traversing mechanisms are housed in a moving carriage on a boom and the transporters will be able to handle every kind of load.

Fully-guarded overhead current-collection equipment for these transporters is being supplied by British Insulated Callender's Cables, Limited. This equipment ensures that all current-carrying parts of the conductor system are adequately insulated and that the bare conductors are enclosed. The Canberra was launched last week at the Belfast shipyard of Harland & Wolff, Limited.

BICC has also announced an order received from Lisbon Electric Tramways for the supply and installation of 9,750 yards of 33-kv. 3-core pressure cable and 9 km. of twin telephone cable and accessories.

European Foundry Apprentice Competition

Detailed Arrangements now Consolidated

The various arrangements which have been made for the European Foundry Apprentice Competition to be held in this country over the period May 23 to 27 have been printed in the JOURNAL on different occasions, and what now follows represents a summation of the programme as a whole.

To date, countries entering apprentices for the Competition are the United Kindom, France, Germany, Holland and Sweden. These (except for Sweden) are fellow-member countries of the European Committee of Foundry Associations. Sweden is entering a team on an invitation from the others. It is probable, also, that apprentices will be admitted from other member-countries of the European Committee—Austria, Belgium, Denmark, Italy and Switzerland. This year will be the third occasion that such a Competition has been held. The object of arranging such an event is to decide which young man from the Western European countries (not more than 20 years' old) is the best foundry apprentice, and which nation has the best team of young foundrymen.

Detailed Programme

On Sunday, May 22, both the British and the foreign apprentices who are taking part in the Competition will arrive at Birmingham, where they will be received at the Birmingham Engineering Centre. The day after their arrival (Monday, May 23) the apprentices will sit for their essay test on a foundry subject at the National Foundry College, and will also undergo a calculation test. After a break for luncheon at the Wolverhampton College of Technology, the apprentices will return to the National Foundry College for their written examination in foundry technology.

This will be followed later that afternoon by a visit to the steel foundry of F. H. Lloyd & Company, Limited, Wednesbury, where they will have an opportunity of seeing the arrangements made for the most important part of the contest—the practical test. This part of the Competition will occupy two days (Tuesday and Wednesday) and F. H. Lloyd & Company have provided facilities on a generous scale for this section of the Competition. In the two days of the practical test, the apprentices have to show their actual craft skill as foundrymen, in moulding and casting an engineering component of considerable complexity. Provision has been made for them to carry out this test in the metal to which each is accustomed in his own home foundry—iron, steel or non-ferrous—and it is here that the real results of study and practice will be decisive.

Other Arrangements

A comparatively easy day has been arranged for the young men on the Thursday. After undergoing the final stage of the competition—a drawing test at the National Foundry College in the morning—the afternoon is to be taken up with a visit to the Shakespeare Memorial Theatre at Stratford-upon-Avon.

During the Thursday afternoon, the judges for the Competition—a team of expert foundrymen drawn from each of the countries represented—will be engaged in the task of checking the results and allotting marks for the various phases of the Competition, and will meet for a final session on the Friday. On Friday morning, the apprentices will leave Birmingham early in the morning *en route* for London, where they will be met by coaches and taken on a tour of the Capital, as guests of the British Council.

The closing ceremony, dinner and presentation of prizes will be held on Friday evening, May 27, at the Tallow Chandlers Hall, in the City of London. At that gathering will be the judges, official representatives of the foundry industry in Britain and abroad, of the Ministries concerned, and the apprentices themselves. The prizes will be presented by Mr. P. J. M. Thomas, M.P., Parliamentary Secretary to the Ministry of Labour. Every apprentice who has taken part in the Competition will receive a memento of the occasion.

The team of three apprentices to represent Britain in the Competition is at present being selected from among six finalists in the British National Foundry Apprentice Competition, conducted recently by the Institute of British Foundrymen. The names of the six who go forward for this final selection are: K. T. Cawser and C. F. Corbett (both of F. H. Lloyd & Company, Limited); A. Elliott (of Darlington Forge, Limited); R. Morley (of Bradley & Foster, Limited); W. N. Styles (of W. & T. Avery, Limited), and T. J. Vincent (of Hamworthy Engineering, Limited). The good wishes of the whole of the British industry will accompany the selected team as they go "into battle" for the honour of being "best European foundry apprentices."

IBF Malvern Conference Fund

Members of the Foundry Trades Equipment and Supplies Association have made group and individual contributions to the 1960 Conference of the Institute of British Foundrymen to be held at Malvern in June. A cheque for £310 7s. has been sent, this being the total amount subscribed to the conference fund by the following members of the Association:—

Wm. Aske & Company, Limited; Augusts, Limited; F. J. Ballard & Company, Limited; Bradley & Foster, Limited; British Industrial Sand, Limited; British Moulding Machine Company, Limited; Cupodel, Limited; F. & M. Supplies, Limited; Fordath Engineering Company, Limited; Foundry Services, Limited; Foundry Suppliers, Limited; FOUNDRY TRADE JOURNAL; General Refractories, Limited; Harborough Construction Company, Limited; W. C. Holmes & Company, Limited; J. W. Jackman & Company, Limited; Marco Conveyor & Engineering Company, Limited; Metals & Equipment (Wolverhampton), Limited; Paterson Hughes Engineering Company, Limited; Peco Machinery Sales (Westminster), Limited; G. Perry & Sons, Limited; Prat-Daniels (Stroud), Limited; Rapid Magnetic, Limited; Ridsdale & Company, Limited; E. A. Roper & Company, Limited; Rubery Owen & Company, Limited; Spencer & Halstead, Limited; Sterling Foundry Specialties, Limited; Sternol, Limited; Colin Stewart, Limited; Universal Pattern & Precision Engineering Company, Limited, and Isaac & Israel Walker, Limited.

THE THIRD ANNUAL INFORMAL DINNER of the London local section of the Institute of Metals attracted an attendance of about 100 members to the Horse Shoe Hotel, London, on March 17, where Mr. R. G. Harper, M.SC., occupied the chair. Much interest was added to the proceedings by an after-dinner talk from the chief guest, Dr. L. C. Nickolls (director of the forensic laboratory at Scotland Yard). Speaking from his own background as a metallurgical analyst, he was able to keep members spellbound with his stories "off the record" of the part played by his department in the war against crime. At the conclusion of the function, Mr. Harper thanked Dr. Nickolls on behalf of members and also voiced their appreciation to the committee members and particularly the secretary, Mr. J. R. Knight, B.SC., for the excellent arrangements made.

Notes fron the Branches

Birmingham & London

Thursday, March 10, was the date selected by the Birmingham branch for the joint works visit at which they were hosts to the London branch of the Institute of British Foundrymen. This event was in reciprocation of the joint visit arranged last year by the London branch. On the last occasion, a trip of combined parties from the two branches was made to Ford's Thames Foundry and the venue this year was again a foundry of the Ford Motor Company, Limited—the Imperial Foundry at Leamington. About 35 members from London and 55 from Birmingham participated.

The choice of venue was convenient for the party of London members who were able to travel by coach along the M.1 motorway, joining with the Birmingham contingent at the Chesford Grange Hotel, near Kenilworth, for luncheon (at which the Birmingham branch were the hosts) before the visit. After lunch, the Birmingham branch president, Dr. V. Kondic, expressed a welcome to the London contingent and introduced Mr. G. Jackson (works manager of the Imeprial Foundry) and Mr. R. T. Wood (works superintendent) who were in charge of the arrangements at the works. Mr. J. Bain, A.M.I.MECH.E., president of the London branch, made suitable acknowledgment and expressed the pleasure it was for London members again to share in a joint function of this nature.

Imperial Foundry

At 2 p.m., the parties boarded coaches for the two-mile journey from the hotel to the Imperial Foundry and the following three hours were spent in touring the shops, Mr. Jackson himself heading the team of knowledgable guides who accompanied the various parties, each of about 10 members.

No assembly of cars is carried on in Ford's Leamington Works, but the visitors found tours of both the foundries and machine-shop needed all the time at their disposal and provided a surfeit of interest. This foundry occupies 4¼ acres on a 13-acre site and is indeed a hive of highly-planned activity. To give some impression of its size, the monthly consumption of primary commodities includes over 50,000 gall. of fuel oil, 9,000,000 cub. ft. of gas and 1,600,000 units of electricity. With 72 staff and 1,400 in the works, the activities include iron, steel and malleable founding for the production of miscellaneous motor-vehicle castings; specialties are made of cast crankshaft and camshaft production, and about 45 per cent. of the whole output of castings is machined on the premises before being despatched to other Ford works. The system of payment adopted is daywork throughout, a high tempo of working being embodied in the careful planning of operations.

For the production of steel for casting, metal is taken from 96-in. dia. cupolas to feed two/three-ton side-blown converters and a 10-ton electric-arc holding furnace, this plant being served by a 20-ton crane. For melting grey iron, there are 96-in., 84-in., and 72-in. dia. cupolas, supplying an oil-fired receiver adjacent, and all operating on cold blast. The moulding machines employed are mainly of the jolt/squeeze type, well served by a comprehensive conveyor system for taking the moulds and returning box-parts. A very large number of cores is required for this varied type of production and coreblowers, coreshooters and shell-core machines are used, each where best suited to the job in hand. Much interest for the visitors was centred in this shop and also in the conveyor labyrinth—

Joint party of Birmingham and London IBF members photographed outside Ford's Imperial Foundry at Leamington. Mr. G. Jackson and Mr. R. Wood, representing the hosts, are respectively second from the right and first from the left in the front row.

Group of visitors inside Imperial Foundry examining a shell core for a transmission housing.

spread over several storeys—for castings cooling prior to knocking-off. This last operation is carried out manually over jigging conveyors, which take away sand and castings. (Even the steel castings produced are furnished with knock-off runners and feeders).

Other Sections

Part of the fettling shop is taken up with a large four-wheel continuous Wheelabrator cleaning plant of the "meat-hook"-and-chain-conveyor type. There is also a continuous rotary Wheelabrator and a batch-type unit in addition to fettling grinders embodying no fewer than 64 snagging wheels. Another continuous plant adjacent to this section looks after the paint-dripping of castings and their stove drying before despatch. The heat-treatment section includes five continuous furnaces for the normalizing of steel castings and for the quick-cycle annealing of malleable.

Of necessity, because time was pressing, the visit to the company's machine-shop was of a somewhat cursory nature, but it was learned that this department houses no fewer than 430 machines, the principal items including an Archdale large borer, B.S.A., Herbert and Ryder automatics, induction hardening plant, A.D.C. burn-off machine and machines for screwing, butt welding and fine-point boring. A visit was also paid to the works inspection and gauge department; the latter contains in addition to normal measuring and gauging equipment, an optical dividing-head, Shadowgraph projector, and profilometer. In the sand laboratory, the continual checking of this commodity was demonstrated by records showing periodic results obtained during each day's run, system sand being used throughout each of the respective sections of the foundry. The chemical and micrographic laboratories were also visited.

At the end of the afternoon, members and guides reassembled in the works canteen for tea and light refreshments. The occasion served appropriately for Mr. M. M. Hallett, F.I.M., senior vice-president of the Birmingham branch, to express to Mr. Jackson, his company, and colleagues the gratitude which all members felt at the conclusion of such a worthwhile visit. On behalf of the London party, Mr. Bain supported these remarks, saying that any qualms which some might have had when they learned they were to visit another automobile foundry had been most effectively disposed of. The Imperial Foundry had proved quite different from the Dagenham and Thames plant and had provided very varied examples of high and quite unusual production. Speaking also for his colleagues, Mr. Jackson acknowledged the vote of thanks and said that at any time if members wished to return individually to examine any particular locations at greater leisure, they would be made very welcome. At this juncture, the Birmingham and London parties separated for return to their home areas, all feeling the day had been very well spent. Many said that comments from and conversation with foundrymen having a different outlook and environment from their own had given a new perspective to what they had seen during the tour and this in itself confirmed and emphasized the value of joint visits.

Northampton Section

The February meeting of the Northampton and district section of the East Midlands branch took place on Saturday the 20th at the Plough Hotel, Northampton. In the absence of the president, Mr. H. Edge, the chair was taken by Mr. R. Jelley, senior vice-president, who introduced the speakers, Mr. W. D. Ford and Mr. J. A.

At a safe distance behind the shower of sparks, one of the parties touring the works are watching steel-making in a 2-ton converter.

In the foreground of this picture, Mr. Jackson (left, centre) explains a point to Mr. G. R. Shotton (IBF senior vice-president), Dr. V. Kondic (Birmingham branch president), and Mr. J. Bain (London branch president) (extreme right). On the left of the picture is Mr. A. J. Crook (Birmingham branch secretary) who was responsible for the arrangements for the joint visit.

Gray and said how pleased he was to preside at a meeting where the papers were to be presented by "members of our own section."

Mr. Ford said his paper, entitled "The Foundry Foreman's influence on Maintenance," had been written specially for the Foundry Foreman's training course at Harrogate. It was well illustrated by slides and pointed out the extreme importance of cleanliness and good housekeeping in all foundries where production was of major importance. The author discussed the economics of good maintenance and care of tools and equipment, devoting considerable time to the provision of good floors by the use of cast-iron chequer plating. Pattern storage both inside and outside the foundry was given attention as was the need for better lighting and the desirability of having a policy of continuous improvement for all foundry equipment.

The second paper, entitled "Refractories," was then presented by Mr. Gray. This was illustrated by an 8-mm. film which Mr. Gray had taken himself in the works and quarries of his own company. The author indicated the manner in which various clays were found close together in one quarry. He said it was necessary to segregate the loads being removed by excavators so as to put them to their separate uses to provide the blends of refactories required by various customers. He pointed out the necessity for having experienced employees for dealing with this type of product and explained the tests which are used to check the quality of the product. Much information was said to be supplied by users of these refractories to the manufacturers, and the lecturer said that this had proved to be a very valuable help to him.

Discussion

Question time was dealt with jointly by the authors and provided an interesting discussion. In reply to an enquiry about the damage caused by rapping coreboxes, Mr. Ford said that many types of excellent mallets were available for this purpose and all were quite satisfactory provided they were maintained in good condition. However, vibrating plates had been tried recently and had given such satisfaction that they warranted further experiment, particularly on water-jacket coreboxes which were rather fragile in construction. The cast-iron floor plates which had been shown on the slides were thought by a member to be extremely expensive and he questioned the cost of this work. Mr. Ford agreed that this flooring was expensive but thought that it was an economy over ten years and a very important safety measure provided the floor was laid flat and true. To do this the plates were laid on top of 2 in. of soft concrete spread over a concrete raft.

Mr. Gray was asked if monolithic furnace linings were in such widespread use as 20 years ago, to which he replied that, in his experience, this was so, in fact the use of monolithic linings was on the increase. To a further question about the availability of refractories in Italy, Mr. Gray said that exports from this country were very considerable which indicated an absence of material quarried in Italy, but this also applied to many other countries, notably Canada and Australia, both of which the speaker thought would probably have suitable natural resources if they were prospected.

When questioned closely about control tests, Mr. Gray said that refractoriness tests were carried out regularly but experience on the job was of extreme importance in the selection of materials of this nature. Outside tests by referees were also used regularly to further control the product. The vote of thanks was proposed by Mr. J. W. Deaton and seconded by Mr. G. Longden.

East Anglia

The February meeting in the Lecture Hall, Central Library, Ipswich, of the IBF East Anglian section was the liaison meeting with guest members from London. The evening was devoted to the reading of the papers entered for the L. J. Tibbenham Award—a short-paper competition.

It was unfortunate that the attendance was small, for two excellent papers were presented. The first "Production of Malleable for the Modern Foundry" was read by its author, Mr. R. C. Castle. This paper dealt with the development of the production of malleable iron, as the need grew for greater quantities of castings and improved consistency of metal temperature, so as to enable any type of job to be cast. The introduction of hot-blast cupolas and installation of holding furnaces, also the operating of these, from their repair and servicing to the finish of the melt, was discussed.

The second paper by Mr. P. O. Stammers, entitled "Work-study and its Applications in Foundries," was read by the section president, Mr. T. D. Oughton, as the author was unable to be present. This paper was a very comprehensive survey of the subject, dealing with examples of incidents which followed the introduction and carrying-out of work-study in an actual foundry.

A very interesting discussion followed, questions on his contribution being ably answered by Mr. Castle and by Mr. Oughton and Mr. H. S. Ward (who was among the audience) on Mr. Stammers' paper. Mr. J. Bain, the London branch president, commented on the excellence of the papers and how much they had interested him, personally. Mr. R. E. Berry passed a vote of thanks to the authors and the discussion was closed by Mr. A. R. Parkes, the London branch secretary, who said how much the section was indebted to Mr. L. J. Tibbenham for his generous gift which was the basis of the award. It reflected a continuance of the donor's interest in the section, of which he had been a founder member.

Automatic Inspection Equipment

On what at first might seem a somewhat incomprehensible subject, *viz.*: "Automatic Industrial Inspection Equipment," Production-Engineering, Limited, are staging on Thursday and Friday of each week until April 22, at 12, Grosvenor Place, London, S.W.1, a private exhibition of the manufactures of eight firms making specialized inspection equipment. At the Press preview of the Exhibition held last week, it was explained that the project is in the nature of a series of training seminars which are being offered to groups of about ten executives during the periods of opening.

Production-Engineering, Limited, are a firm of management and engineering consultants, having a staff of 200 in the UK and 150 abroad and their primary aim in organizing this exhibition, film shows and talks is to show the application of selected examples of instrument technology applied in various schemes of automation. The firm contends that in this sphere much can be learned by British industry, and that works executives who are seeking reduction in product cost as an alternative or in addition to new markets and products should investigate first whether their processes can be automated for quality control and money saved thereby.

One of the films, for example, shows scenes from the American automobile industry, where such quality control is applied to acceptance and rejection of components on the basis of dimensional accuracy and also in the selection of parts for matching assembly. One of the "shots" is of unmachined connecting-rods, which are being checked automatically for total weight at each end (giving the balance), thickness and Brinell hardness. Other examples relate to motor-car camshafts, valve guides, tappets and pistons. Mechanisms of this type are reported to cost between £4,000 and £12,000 and capable of dealing with about one component per second. A second film which is being shown demonstrates the automatic handling of components so as to feed them into the type of measuring machines as are illustrated in the earlier picture.

Exhibition

The eight firms at the Exhibition are—Mullard Equipment, Limited; Teddington Industrial Controls, Limited; Baldwin Instrument Company, Limited; Industrial Products (Speco), Limited; Research and Control Instruments, Limited; Pye, Limited; Racal Instruments, Limited, and Venner, Limited. While there are on view few, if any, applications directly related to foundry practice, it is not difficult to envisage such possibilities. For example, an instrument which can differentiate shape or code markings could, presumably, be applied to sorting small castings arriving from a conveyor belt. Similar devices also could be applied to inspecting them for critical dimensions without needing operators. Counting, in another example, is being demonstrated at the Exhibition using three different techniques. Yet another application shows vibration measurement of a machine-tool as a check on its efficiency during automatic machining. There is one stand devoted to closed-circuit television and here it is being demonstrated how an executive, sitting at a desk, can "spy" on a process happening thousands of yards away (in fact up to 60 miles) at a cost of about £750 for one television camera and receiver. For an extra cost of £175 for each camera-head and a switching unit at £150, he could view any one of five locations at will. Not all the instruments are fully automatic,

(*Continued at foot of col.* 2)

for example, a roughness-gauge is available, which merely involves stroking a component with a stylus—no doubt this could be applied to castings inspection if an appropriate comparator is chosen. Taken as a whole, the objective of the organizers appears to be well capable of realization, since the whole proceedings do tend to make one quality-measurement conscious. Applications to attend the Exhibition, film shows, etc., should be marked "Exhibition" and addressed to Technical Division, Production-Engineering, Limited, Wick Road, Egham, Surrey.

New Patents

(Copies of complete specifications are obtainable from the Patent Office, Sales Branch, 25, Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d.)

812,481. Plessey Company, Limited, 56, Vicarage Lane, Ilford, Essex.

Casting of permanent magnets for loudspeakers. The magnets are cast side by side to form a stick of magnets joined by connecting portions which are connected to each individual magnet wholly outside the neck area of small clearance.

812,484. Eisenwerke Gelsenkirchen A.G., 2-4, Hohenzollernstrasse, Gelsenkirchen, Germany.

Process and apparatus for the continuous casting of hollow metallic elements such as pipes or tubes, flanged or thickened at one end.

812,870. Canadian Copper Refiners, Limited, Suite 1709, Bank of Nova Scotia Building, 44, King Street, West, Toronto, 1, Ontario, Canada.

This invention relates particularly to apparatus for removing or unloading vertically-cast ingots or cakes of a metal, such as copper, from moulds in which such ingots are cast, and preferably for lowering them into a tank of liquid such as water, for cooling them prior to further handling.

812,905. Hercules Powder Company, 900, Market Street, Wilmington, 99, Delaware, USA.

Process for moulding foundry shells. Also claimed is a composition based on sand and a phenol-aldehyde binder. This is a simultaneous reaction of a petroleum hydrocarbon-insoluble pine-wood resin—being from 10 to 60 per cent. by weight of the total phenolic ingredients. This company's co-patent **B.P. 812,906** describes and claims a related moulding composition in which the binder is prepared by fusing a phenol-aldehyde-novolak resin and a substantially petroleum hydrocarbon-insoluble wood-resin. It further describes a moulding process using such a composition.

812,940. Desmond Cleverdon, "Tantany," Southampton Road, Lyndhurst, Hants.

A process for investment casting. This invention makes use of the formation of a pattern of a polysulphone resin (such as butene polysulphone) which, although solid at room temperature, when the investment is heated goes off as gaseous products, leaving a cavity substantially free from residue, so that parts may be cast to close dimensional tolerance. It is also claimed that excellent surface finish can result. Experiments carried out with different resins yielded the following ash residues: metal-stabilized butene polysulphone—0.2 per cent.; unstabilized butene polysulphone—nil; sulphone-stabilized butene polysulphone—nil.

News in Brief

THE BRITISH TRANSPORT COMMISSION is to appoint a full-time negotiator, whose work will consist of seeking new trade for the ports of Grimsby and Immingham.

THREE FILMS illustrating a wide variety of grinding methods were shown by the Carborundum Company, Limited, to a large audience of Sheffield executives at the Grand Hotel, Sheffield, on March 15.

A 42-HOUR WEEK is to be operated at the Doncaster firm of brassfounders, Peglers, Limited. To deal with orders in hand the firm is having to re-employ a number of married women to work evening shifts in the machine shop.

LAURITE HAS BEEN IDENTIFIED in Sierra Leone. It was first discovered in platinum concentrates from the Guma Valley and has now been observed in chromite concentrates collected from near Senduma in the Niawa Chiefdom, Kenema District.

IZONS & COMPANY, LIMITED, Albion Works, West Bromwich, this year attains the 200th anniversary of its establishment. Mr. W. H. Thursfield, its managing director, was recently elected president of the National and Midland Ironfounders' Association.

GOVERNORS OF North Staffordshire Technical College have recommended that the name of the college should be changed to the North Staffordshire College of Technology. It is felt that the size of the college, the expansion being carried out, and the amount of advanced work undertaken justify the step.

TWO MEMBER COMPANIES of the Power-Gas Group, Ashmore, Benson, Pease & Company Africa (Pty.), Limited, of Johannesburg, and P. G. Engineering, Limited, of Stockton-on-Tees, are to carry out an order valued at over £1,000,000 for the Rhodesia Broken Hill Development Company, Limited.

TO ENABLE the entire staff to be housed in one centre the headquarters of the Nobel division of Imperial Chemical Industries, Limited, is to be moved from Glasgow to Stevenston (Ayrshire), near the division's largest producing factory at Ardeer. The transfer is to be phased and will take two and a half years.

WORK HAS STARTED on a copper-refining and smelting plant at Alaska, near Sinoia, Southern Rhodesia, at a cost of £750,000. It is being erected for Messina Rhodesia Smelting & Refining Company, Limited, and should be operating by October. From then on, concentrates from the Alaska and Mangula mines will be treated.

FOLLOWING EXTENSIVE exploration by Colvilles, Limited, on a deposit of limestone at Hardendale Nab, near Shap (Westmorland), a Glasgow company is to undertake large-scale quarrying. The limestone is suitable for metallurgical purposes and the project will involve the laying down of modern crushing plant and the installation of a railway siding.

REMINGTON RAND, LIMITED, are planning expansion of their typewriter-manufacturing plant on the Scottish Industrial Estate, Hillington, near Glasgow. An area of some 131,000 sq. ft. is to be added to the existing works of 431,000 sq. ft., and it is anticipated that there will ultimately be an increase of from two to three hundred employed by the Hillington plant.

THE GENERAL ELECTRIC COMPANY, LIMITED, has received a repeat order from Johannesburg Municipality valued at more than £1,250,000 for two further 60-mw turbo-generator sets, complete with feed-heating plant, for Kelvin "B" power-station. This latest order covers the third and fourth sets for the station, an order for the first two machines being already in hand.

THE GEOLOGICAL SURVEY OF PAKISTAN and the Department of Petroleum and Minerals have been merged with the Bureau of Minerals. The function of these departments as well as those of the Fuel Directorate of the Department of Supply and Development in regard to the development of coal resources have also been transferred to the Bureau.

PRODUCTION FIGURES for Mt. Isa Mines, Limited, over the latest four-week period show that output rose steeply to an average of nearly 7,800 tons of ore daily. The total ore treated during this period was 218,250 tons, the second highest on record. There was also a big increase in the amount of copper-ore treated, the figure being 154,710 tons, as against 126,139 tons in the previous period. Lead ore treated rose from 54,402 tons to 63,548 tons.

THE "A" AMBULANCE TEAM of English Steel Corporation, Limited, won the "Sheffield Telegraph" Cup for the second year in succession in the competition organized by the Sheffield Area Industrial Group of the Royal Society for the Prevention of Accidents. Next in placing were Yorkshire Engine Company, Limited, Jessop-Saville, Limited, and Associated Electrical Industries, Limited (traction division). Seventeen teams competed on March 12.

THE CHANGING RÔLE OF THE FOREMAN in a technological age was discussed by Mr. J. H. Kean, deputy managing director of Joseph Newsome & Sons, Limited, at the weekend conference of the Industrial Welfare Society which opened at Scarborough on March 18. He said he was convinced that peace would come to industry only through the efforts of managements prepared to accept that frank and complete joint consultation must take place at all levels on all issues affecting employees.

THE Koninklijke Machinefabriek Gebr. Stork & Co., N.V., of Hengelo, Holland, has received from the International General Electric Company—the American-based firm which is chief contractor for building Euratom's first nuclear power-station in Italy—an order for the supply of two steam generators, each with an output of about 110 tons of steam per hour. This order, the first received in Holland for a component of a nuclear power-station, was obtained against keen international competition, it is stated.

A TRANSFORMER said to be the largest ever produced in the Southern Hemisphere has been built by the English Electric Company of Australia Pty., Limited, at their factory near Brisbane. This 70-ton, 20-ft. high unit of electrical equipment represents 14 months' work at the Rocklea factory. English Electric won the contract for its construction in the face of keen Australian and foreign competition. Due to its size, the transformer was taken through Brisbane's streets at night to the Brisbane wharves for shipment to Hobart.

A CONFERENCE ON HEAT-TREATMENT PRACTICE, organized by the British Iron and Steel Research Association, is to be held at Harrogate on July 5 and 6. The main aspect of the subject to be considered will be "carburizing," and the various papers will cover the theory and practice of this process and the properties of carburized steels. Full details and registration forms will be available from May 6, applications being made to the technical secretary, Metallurgy (General) Division, BISRA, 11 Park Lane, London, W.1.

FOUR DISTRICTS of Madhya Pradesh—Sehore, Durg, Bastar and Bilaspur—in India, are planned to be

covered this year under the Geological Survey of India-sponsored scheme to make the layman mineral-minded and to train non-technical people in the search for minerals. A few districts in each of the States have been chosen to launch the scheme. Geologists are making an extensive tour of the districts and by means of lectures and showing of specimens and finished products, are demonstrating methods of identifying the more common minerals.

AN OFFER OF £100,000 has been made to develop the former naval air station at Donibristle, Fife, as an industrial estate. It comes from the Highland Engineering, Limited, an Edinburgh development company, and plans for the estate would probably include a heli-port and a helicopter maintenance base. Mr. Peter Kay, director of the company, said: "The offer was made to the Admiralty but it was rejected. Now we are waiting for a further approach from them." The station at Donibristle, the closure of which is now virtually complete, was formerly a naval helicopter establishment.

RECENTLY Glenfield & Kennedy, Limited, Kilmarnock, despatched a consignment of micro-straining machines and ancillary equipment worth over £113,000, to Canada. Micro-straining was first developed by the Ayrshire firm in 1945. The purpose of the process is the removal of microscopic suspended matter from water and effluents by simple automatic mechanical means at low cost. This is achieved by employing rotary drum filters fitted with very-finely woven stainless-steel fabrics, the finest of which has 165,000 apertures per sq. in., each measuring only 23 microns, or 0.009 in. across.

A NEW FABRICATION SHOP has been added to the works of Keeton, Sons & Company, Limited, of Sheffield, a member of the Firth Cleveland group. Its completion enables the firm to carry through its declared policy of constructing all future sheet-metalworking machinery in fabricated steel in preference to cast iron. The first guillotines to conform to the new practice were the 6 ft., 8 ft., and 10 ft. by $\frac{1}{4}$ in. guillotines announced last year. Although the firm's own foundry has been closed down, arrangements have been made for the casting of components required for the maintenance of previous models, including the Keetona $\frac{1}{4}$-in. range, which will still be supplied in cast iron.

"I BELIEVE we owe a duty to ourselves to try and damp down this stock-building development," said Professor D. C. Hague, Professor of Applied Economics at Sheffield University, at the conference of the Institute of Personnel Management at Buxton on March 10. He went on, "We need stocks as shock absorbers when supplies are low, but it is a fact that when they should have been going up, stocks have actually been going down." He said the stock-building problem was particularly noticeable in the steel industry. As some types of steel were in short supply at the moment, some manufacturers were ordering more than they needed, in order to get a little and build up a stock. This led to the impression that the supply was shorter than it actually was, and as a result the manufacturers placed even larger orders.

REDLER INDUSTRIES, LIMITED—Mr. Herbert V. Cozens, chairman of Cozens & Sutcliffe (Holdings), Limited, has been elected chairman of the company and of its subsidiaries. Mr. Francis G. Bullimore, a director of Cozens & Sutcliffe (Holdings), Limited, has also been elected to the boards of these companies. Mr. S. H. Forbes, a director and secretary of Redler Industries, has been elected vice-chairman of the company.

Obituary

Mr. J. W. JESSOP, whose death is announced, was a director of William Jacks & Company, Limited, metal merchants, etc., of London, E.C.2.

Mr. T. C. JAMES, chairman of the Wolverhampton Metal Company, Limited, non-ferrous metal manufacturers, Wednesfield, Wolverhampton, has died.

Mr. WILLIAM BUCHANAN, chief production engineer for 30 years with G. & J. Weir, Limited, Glasgow, has died at the age of 68. He retired two years ago after more than 50 years' service with the company. In 1949 he was awarded the M.B.E.

The death has occurred at the age of 76 of Mr. BENJAMIN BREARLEY, a director and former manager of H. E. Lupton & Sons, Limited, iron and brass founders, of Accrington. He had been with the firm for 53 years when he retired eight years ago after being manager for 25 years.

The death is reported of Mr. D. W. ATKINSON, formerly works manager of the steel foundries of Head, Wrightson & Company, Limited, Thornaby-on-Tees, Yorks. Mr. Atkinson was a member of the Institute of British Foundrymen and had served on the Council of the Tees-side branch.

The death took place last week of Mr. BENJAMIN PRICE of Coseley, a well-known iron founder and director of John Thompson (Castings), Limited, Ettingshall. Mr. Price, who was 43, had been with the firm since leaving school 29 years ago. His three brothers also work with the John Thompson group.

Mr. H. G. RAMSELL, general manager of the British Divisions of the Yale and Towne Manufacturing Company, died on March 16 at the age of 61. He was a founder member of the Institute of Materials Handling and a member of the Institution of Mechanical Engineers and of the Institution of Production Engineers as well as of the Institution of Works Managers.

The death occurred on March 16 of Mr. TOM LAUNCELOT TAYLOR, for many years a leading figure in the engineering industry. He was 81. Until several years ago, Mr. Taylor was chairman and managing director of Taylor Bros. & Company, Limited, steelmakers, etc., of Manchester. He was at one time chairman of the Metropolitan Carriage, Wagon & Finance Corporation, Limited, formed by Cammell Laird & Company, Limited, and Vickers, Limited, of which he was also a director. He had also served on the board of the English Steel Corporation, Limited.

IBF Slough Section Social Event

Members of the Institute of British Foundrymen wishing to join the Slough section party for the show and dinner event on April 30 are reminded that their applications must be in the secretary's hand by March 29. Leaving Slough by coach at 4.30 p.m. members (and ladies) will first attend the early evening showing of the London Cinerama presentation "South Seas Adventure." This will be followed at 8 p.m. by dinner and dancing at the Regent Grill, Piccadilly. Tickets, price 37s. per head, are obtainable from Mr. R. J. Bown, 5, Cape of Good Hope Road, Chalvey, Slough.

PULSOMETER ENGINEERING COMPANY, LIMITED—Mr. Eric Sanders has resigned from the board on a disagreement over policy. He joined the board when the company acquired B.A.L., Limited, in 1958, of which he was chairman and managing director.

Gas Exhibition at Harrogate

From March 28 to April 1, a comprehensive demonstration of the diverse uses of gas in modern industry and commerce will be held in the New Exhibition Hall, Harrogate. A similar exhibition was held for the first time at the Royal Horticultural Hall, London, in 1957, when over 10,000 people connected with industry attended by special invitation. In fact, so successful was this exhibition that it was repeated in London this year, from March 1 to 12, sponsored by the Eastern, North Thames, South Eastern and Southern Gas Boards.

The "Gas at Work in Industry" Exhibition to be held at Harrogate has been organized jointly by the North Eastern and Northern Gas Boards, and will be the first of its type ever to be held in the provinces. It will be bigger in scope than the London exhibition, and emphasis will be given to applications of gas which are specially applicable to the North of England. Included in the exhibition are the following sections: research and development projects by the North Eastern and Northern Gas Boards; foundry equipment and heat-treatment; vitreous enamelling and paint curing; flame-hardening and cutting; industrial hot-air processes; industrial burners; incineration; water-heating equipment; central-heating boilers; radiant heating, and gas-fired air-heaters of all classes.

Foundry Equipment

In the foundry equipment and heat-treatment section, two furnaces will demonstrate clean heat-treatment; one, a shaker-hearth furnace for case-hardening or surface-carbon correction, and the other a rotary-retort furnace treating small parts and utilizing a simplified version of atmosphere gas producer. A conventional belt-conveyor furnace with a cooling section for bright annealing and brazing will also be in operation. The field of flame heat-treatment and flame-hardening equipment, with regard to gear-wheel teeth, for example will be shown. The display by Fairbairn Lawson Combe Barbour, Limited, will show shell-moulding for the production of accurate thin-wall sand-moulds for precision casting.

Other Exhibits

On the stand devoted to high-temperature radiant-heating and gas-burners, burners will be arranged in such a way that visitors will be able to operate them. On this stand, too, an appliance will be in use for enamelling badges, and a demonstration of a new high-speed core-drying process will be given. The use of gas for galvanizing, die-casting, stereo metal melting and many other purposes will be seen. Low-temperature heating covering a very wide range of processes, including drying and product-finishing operations by the use of hot-air-circulating ovens will also be demonstrated.

Research

Last but not least, a special section is being devoted to a number of entirely new projects which have been developed by the research departments of the North Eastern and Northern Gas Boards.

One of the principal exhibits by the North Eastern Gas Board is to be a portable machine for the furnaceless stress-relieving of finished components, using specially designed jet-burners in combination with high-velocity hot-air recirculation. Another is the furnaceless heating of tube ends *in situ* to a temperature of 1,000 deg. C. An experimental crucible furnace incorporating recuperation of combustion air will also be on show. The Northern Gas Board display will include: Gas burners for the drying and heating of shank ladles; burner equipment for the lighting of cupola furnaces, and burner equipment for heating foundry ladles.

The exhibition is not open to the general public, but some 3,000 invitations are being distributed by the Boards to industrial and commercial establishments, heating engineers, architects, etc. Any firms or individuals who would like to visit the exhibition and who may perhaps inadvertently not receive a direct invitation are invited to apply for tickets stating the number required. Applications should preferably be in writing to either of the following addresses: The Commercial Manager, North Eastern Gas Board, Head Office, Bridge Street, Leeds, 2; the Commercial Officer, Northern Gas Board, Head Office, 30, Grainger Street, Newcastle-upon-Tyne.

Gear Research Centre?

The setting up of an information centre in Britain to collate the results of gear research in all establishments was suggested on March 17 in Glasgow by Dr. C. Timms, head of the Mechanisms, Metrology & Noise Control Divisions of the National Engineering Laboratory at East Kilbride.

Dr. Timms, who was presenting the 1959 Viscount Nuffield paper, "Recent Developments in Spur and Helical Gears," to the Institution of Engineers & Shipbuilders in Scotland, said that the UK was still dependent on foreign supplies of measuring instruments of the highest precision. Not only was there need for closer co-ordination between the gear industry and instrument manufacturers but many firms making inspection equipment had limited facilities for developing important optical and electronic techniques.

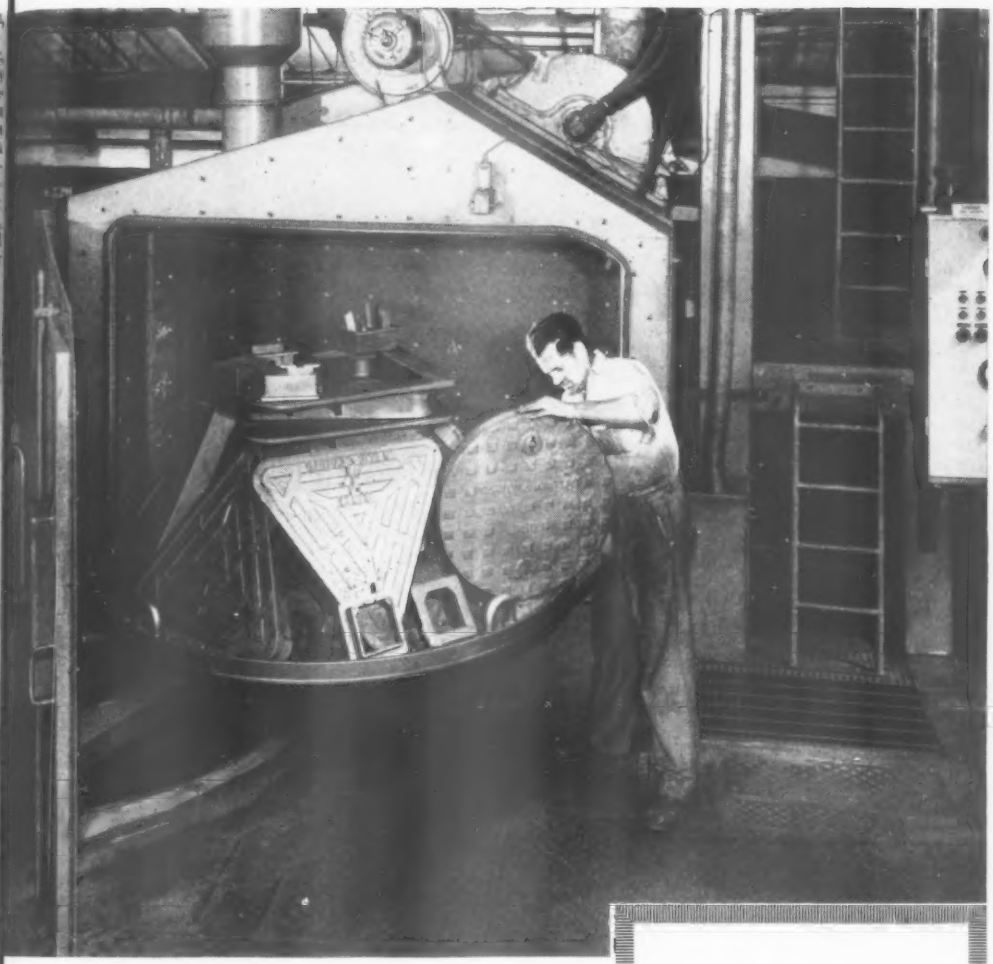
In Britain, he said, the manufacture of gear instrumentation was being done on a piecemeal basis, and too many firms regarded it as a sideline. Because of that, there was no counterpart to well-established firms abroad. Basic work done in this country had provided a new approach to engineering measurement and machine control, and it was hoped that machine-tool manufacturers and instrument firms would take full advantage of the work. In the matter of the accuracy of gear-cutting machines, there was need for improvement so far as the small and medium size range was concerned, but production capacity for grinding spur and helical gears above 3-ft. dia. was limited to machines of foreign manufacture.

In conclusion, Dr. Timms said that the subject of gear noise had not been seriously considered in Britain, although considerable research on the subject had been carried out elsewhere, particularly in America. At a time when the general problem of noise was receiving attention, a scientific appraisal of gear noise in particular should be made.

North British Locomotive's Net Loss

Group net loss for 1959 of £1,349,566 is reported by the North British Locomotive Company, Limited, Glasgow. There was a loss of £909,512 in the previous year. The loss, which is after all charges, includes provisions for losses on contracts £462,306 (£103,158), and elimination of administration expenses from work-in-progress £251,399 (nil). It is also after tax credits of £3,295 (debit £126). Group loss attributable to the holding company is £1,348,726 (£910,529).

Last ordinary dividend was 5 per cent. for 1955 and the preference is in arrears from January 1, 1956. Last October, holders were told there was "a great deal to be done" to bring the company to rights, and were warned not to expect any dividend in 1959 and "maybe nothing for two or three years."



Baker Perkins Foundry Machinery at work... *at Garton & King Ltd.*

In Exeter, Garton & King Ltd. use this Baker Perkins Swing Table Shot Blast Machine to treat a very wide range of pieces. This machine saves space—it occupies less room than free tunnel type units. It saves power—you don't need compressed air plant. And although it is based on the rotary table principle, it can handle larger and heavier pieces than conventional machines.

Write today for details.

BAKER PERKINS
Foundry Machinery Division
BEDEWELL WORKS · HEBBURN-ON-TYNE · ENGLAND

BP.F8

HISTORICAL NOTE

"At the sign of the Golden Hammer".

The predecessors of Garton & King Ltd., were known in 1662, and they have had a foundry since about 1800. They now produce a wide range of municipal castings and gear wheels, besides general engineering castings in iron, gunmetal and aluminium for use at home and overseas. They still preserve their trade sign of "The Golden Hammer" which has been in use for over 200 years.

Personal

Mr. P. A. DRACUP has been appointed foundry manager of Smith & Fawcett, Limited, Bradford.

Mr. VERNON CHAPMAN, lecturer in mechanical engineering at Bradford Technical College, has been appointed the first principal of the new Inverness technical college.

Mr. H. R. GOMERSALL, formerly planning officer (reconstruction), general manager's office, the Eastern Region of British Railways, has been appointed regional planning officer in the same office.

Mr. R. T. REDFERN, vice-chairman and managing director, Bryan Donkin Company, Limited, iron-founders and engineers, Chesterfield, retires at the end of this month and will be succeeded by Mr. S. FARRER.

Mr. W. N. COLLINS, assistant managing director of F. Perkins, Limited, has been elected chairman of the Society of Motor Manufacturers' and Traders' marine section in succession to Lt. Comdr. J. W. THORNYCROFT.

Mr. T. D. H. ANDREWS, director and general manager of Dowty Nucleonics, Limited, has been appointed managing director and Mr. D. G. A. THOMAS, the chief engineer, has been elected a director of the company.

Mr. HENRY ALLEN, manager of industrial relations at the British Divisions of the Yale & Towne Manufacturing Company, has been appointed by the Minister of Labour as chairman of the Willenhall Local Employment Committee.

Dr. M. E. HAINE has been appointed director of the Harlow research laboratory of Associated Electrical Industries, Limited. He succeeds Dr. G. W. SUTTON who has retired, but is continuing in a consultative capacity until May.

A presentation has been made to 64-year-old Mr. ROBERT BARNETT to mark his retirement from the post of foreman at the Hubert Works department of W. Asquith, Limited, machine-tool makers, Halifax—a position he has held for 25 years.

Field-Marshal Sir WILLIAM SLIM has been appointed an additional member of the board of Imperial Chemical Industries, Limited. He will act as a non-executive director. This is the fourth directorship Sir William has accepted since February.

Mr. I. B. COOKE has been appointed director and general manager of the Industrial Fan and Heater Company, Limited, Birmingham, manufacturers of heating, ventilating and dust-extraction plant. The firm is a member of the Simms group of companies.

Mr. ALBERT KILNER, foundry foreman at Williams Bros. (Sheffield), Limited, has retired after an association with the firm for 56 years. On behalf of staff and colleagues he was presented with a studio couch and reading lamp by Mr. Desmond H. Williams, managing director.

Sir CECIL WEIR has been appointed chairman of the British Standards Institution's Export Panel. The previous chairman was Mr. J. L. S. STEEL, export director of Imperial Chemical Industries, Limited. Sir Cecil is chairman of International Computers and Tabulators, Limited.

Mr. DOUGLAS LANG, who has been appointed chief sales engineer at English Electric's Aircraft Equipment Division, Bradford, joined the division in September, 1956, and in 1958 became a technical sales engineer. Mr. Lang succeeds Mr. T. E. SIMMS, who has become chief project engineer.

Major W. R. BROWN, chairman and managing director of the Power-Gas Corporation, Limited, since 1957, is retiring at the end of this month. Major Brown joined the firm more than 30 years ago, became a director in 1942, vice-chairman in 1956, and managing director in the following year.

Traders' Road Transport Association (the national organization for "C" licence holders) announce that Mr. F. D. FITZ-GERALD, O.B.E., for the last 15 years national secretary of the Association, is shortly retiring. He is succeeded by Mr. H. R. FEATHERSTONE, who has been the TRTA assistant secretary since May, 1958.

Mr. W. L. MATHER, director of Mather and Platt, Limited, engineers, Manchester, has returned to this country after a five-month tour of Greece, Turkey, Lebanon, Persia, Pakistan, India, Siam, Malaya, Singapore, Australia, New Zealand, the Philippines, Hong Kong, Japan, Hawaii and the United States.

Dr. J. WASHBURN, Associate Professor of Metallurgy in the University of California, is to give a lecture on "Deformation and Fracture of Ionic Crystals" under the auspices of the metal physics committee of the Institute of Metals. The meeting will take place at the Institute's Headquarters, 17, Belgrave Square, London, S.W.1, on April 27 at 6.30 p.m.

Mr. A. E. COHEN of A. Cohen & Company, Limited, will be retiring at the end of July. He will be succeeded as general works manager and metallurgist by Mr. A. R. FRENCH, late of J. Stone & Company (Charlton), Limited. Mr. French has already joined the firm so as to collaborate with Mr. Cohen on the detailed organization before taking control.

Mr. C. W. SPANGLE has been appointed managing director of Honeywell Controls, Limited. For the past four years he has been managing director of the company's German associates. Mr. Spangle succeeds Mr. E. C. VORLANDER, who has left to take charge of the micro-switch division of the company's US associates, the Minneapolis Honeywell Regulator Company.

Dr. E. R. WALTER, principal of Lincoln Technical College for 29 years, is to retire in July. He has been connected with the College for nearly 40 years. Dr. Walter was apprenticed as an engineer with Clayton & Shuttleworth, Limited, Lincoln, and in 1921 joined the staff of the College as a lecturer. He later became head of the engineering department, and was appointed principal in 1931.

Mr. W. C. HESELWOOD, head of the physics section of the United Steel Companies' laboratories at Swinden House, Rotherham, has left on a three-week visit to Japan. He is deputy-leader of the British delegation to the third international conference on non-destructive testing at Tokio. On his way back, Mr. Heselwood will visit research laboratories in Honk Kong, Bangkok and India. He is president of Sheffield Metallurgical Association.

The Minister of Power has appointed Sir THOMAS WILLIAMSON, C.B.E., J.P., and Mr. HARRY DOUGLASS to be part-time members of the Iron and Steel Board with effect from June 1, in place of Sir ANDREW NAESMITH, C.B.E., J.P., and Mr. J. OWEN, whose appointments expire on May 31. Sir Thomas is general secretary of the National Union of General and Municipal Workers, and Mr. Douglass is general secretary of the Iron and Steel Trades' Confederation.

Dr. JACK NUTTING was appointed to the Chair of Metallurgy of Leeds University by the University Council on March 16. He graduated at the University of Leeds with first-class honours in metallurgy 15 years ago and from 1945 to 1948 worked as a research assis-

tant in the department, under the late Professor A. Preece. He became Demonstrator in Metallurgy at the University of Cambridge in 1949 and was appointed to his present position of Lecturer in 1954.

Mr. J. R. COTTERILL has been appointed manager of the outside-services department at the Witton works of the General Electric Company, Limited. This is a new department formed to co-ordinate erection, commissioning, and post-commissioning service of electrical plant. Mr. Cotterill received his engineering training at Witton and became a test-engineer there in 1925. Subsequently he was appointed deputy chief inspector and was promoted to chief inspector in 1949. Six years later he was appointed manager of the engineering works concerned with manufacture of electrical rotating plant. Mr. Cotterill is a Justice of the Peace and a member of the Institutions of Electrical, and Mechanical Engineers; the Institute of Marine Engineers; and of the American Institute of Electrical Engineers.

Mr. RALPH L. SIMPSON, works manager of Modern Foundries, Limited, Halifax, retired last month after 32½ years' service with the company. His apprenticeship to patternmaking was served with Dick Kerr & Company of Preston (now part of the English Electric Company). Following service in the first world war he returned to the firm, but shortly afterwards went to America where he was employed by the Northern Electric Company of Montreal and the General Electric Company, Boston, Mass. On his return to England in 1921, he held posts in the foundry and patternshop of English Electric at Preston, and joined Modern Foundries in 1927 as patternshop foreman, eventually becoming works manager in 1956. Mr. Simpson has been a member of the Institute of British Foundrymen for many years and was president of the West Riding of Yorkshire branch in 1951-2. His proud record is that he has not had a day off work in 32 years.

Increase in Capital

CLAYTON DEWANDRE COMPANY, LIMITED, mechanical engineers, ironfounders, motor engine and chassis manufacturers, etc., of Lincoln, increased by £2,000,000, in £1 ordinary shares, beyond the registered capital of £1,000,000.

SPENCER WIRE COMPANY, LIMITED, Wakefield, increased by £686,900, in 150,000 cumulative second preference, 700,000 non-cumulative third preference, and 36,900 ordinary shares of £1 each, beyond the registered capital of £13,100.

FIRTH-VICKERS STAINLESS STEELS, LIMITED, Sheffield, increased by £1,000,000, in £1 ordinary shares, beyond the registered capital of £5,000,000.

SHEPCOTE LANE ROLLING MILLS, LIMITED, Sheffield, increased by £1,500,000, in £1 ordinary shares, beyond the registered capital of £900,000.

E. H. SYMONDS, LIMITED, metal dealers, etc., of London, S.W.1, increased by £30,000, in 60,000 "A" ordinary and 540,000 "B" ordinary shares of 1s. each, beyond the registered capital of £40,000.

BRITON FERRY STEEL COMPANY, LIMITED, Briton Ferry, Neath, increased by £150,000, in £1 ordinary shares, beyond the registered capital of £1,000,000.

MCKEE, HEAD WRIGHTSON, LIMITED, engineers to the chemical and petroleum industries, etc., of London, E.C.1, increased by £249,900, in £1 ordinary shares, beyond the registered capital of £100.

INTERNATIONAL HARVESTER COMPANY OF GT. BRITAIN, LIMITED, London, E.C.1, increased by £2,000,000, in £10 ordinary shares, beyond the registered capital of £3,000,000.

CLAY CROSS (IRON & FOUNDRIES), LIMITED, Clay Cross, Chesterfield, increased by £660,000, in £1 ordinary shares, beyond the registered capital of £60,000.

HALESOWEN STEEL COMPANY, LIMITED, Halesowen (Worcs), increased by £100,000, in 4s. ordinary shares, beyond the registered capital of £215,000.

STANDARD RANGE & FOUNDRY COMPANY, LIMITED, Watford, increased by £160,000, in 5s. ordinary shares, beyond the registered capital of £100,000. Each of the existing 90,000 ordinary shares of £1 has been sub-divided into four ordinary shares of 5s.

MORGAN CRUCIBLE COMPANY, LIMITED, London, S.W.11, increased by £3,000,000, in 2,720,000 "A" ordinary and 280,000 "B" ordinary shares of £1 each, beyond the registered capital of £7,000,000.

Raw Material Markets

Iron and Steel

Overall production of pig-iron continues to expand and, although the number of furnaces now operating is smaller, record tonnages are being obtained from the larger and more modernized plants. The steelworks' requirements of basic pig-iron are continuously increasing and heavy demands are being made on producers for supplies for consumption and stocking. The shortage of suitable steelmaking scrap grows daily more pronounced, entailing a larger use of pig-iron by the steelworks in their mixtures. Makers of hematite pig-iron are also benefiting by the larger demands made by the steelworks for ingot moulds and heavy castings.

The blast furnaces providing the engineering and speciality foundries with the low-phosphorus irons and hematite are able to maintain outputs at capacity levels and are generally able to dispose fully of their makes. The foundries catering for the motor vehicle trade are fully employed and there is no noticeable slackening in demand.

For high-duty castings demands are at good levels and the foundries supplying this type of casting are busy—apart from those which cater mainly for railways and collieries. These foundries continue to consume substantial tonnages of the low-phosphorus pig-irons and hematite, but to a lesser degree, the refined irons.

Overall supplies of these irons appear adequate to meet present demands and, although some brands of the low-phosphorus irons and hematite are limited in supply, alternatives are available. Outputs of the low-phosphorus irons are being increased by additional furnace capacity and so far as can be foreseen the foundries should have no difficulty in covering their current and forward requirements.

By the increased demand for builders' castings and a steady demand from the domestic utensil trade, many of the light foundries are able to obtain fairly good outputs. Varying degrees of activity prevail at the jobbing and textile foundries. The requirements of these foundries for the high-phosphorus pig-iron are met satisfactorily and makers can give prompt delivery from stock or current production.

The ironfoundries are taking up big tonnages of scrap, and there is a persistent demand for heavy cast-iron and machinery scrap. Foundry coke deliveries are satisfactory and ganister, limestone, and firebricks are easily obtainable.

The re-rollers maintain good outputs of all their products, and most establishments are working at capacity levels consistent with available labour which falls short of full requirements. There is a sustained heavy demand for small bars and light sections and rollers of reinforcing rods are heavily booked for supplies.

There has been some slight improvement in deliveries from home steelworks of the larger sizes of billets, but there is a shortage of 2 in. billets which are essential for many of the smaller mills. Overall, present deliveries of steel semis to the re-rollers are much below demands and most of the steelworks are committed for their outputs for some time ahead. All arisings of suitable defectives and crops are readily accepted.

Non-ferrous Metals

Copper in London is showing strength due to the consistently good level of demand and to the particular fact that stocks of refined copper in LME warehouses dwindled further last week to only 2,372 tons. The backwardation is now approximately £16 a ton and the outlook, so long as stocks do not rise rapidly, is for present price levels to be maintained.

The position in London is in sharp contrast to that in America where business is reported as slow. Indeed, the custom smelter intake price for scrap has been reduced by another 1 cent per pound to 23 cents, equivalent to a price of less than 30 cents a pound for electrolytic copper 3 months hence. This compares with the present price of 33 cents a pound quoted by both the custom smelters and the producers. The outlook is, therefore, for the further weakening of the US price structure and this is bound to have its repercussions on the London market, although with demand continuing satisfactory and stocks at their present meagre level, the price decline should be fairly gradual.

Tin is somewhat patchy, although on the whole firm. The market is still under the influence of the International Tin Council's explanation that the increase in the next quarter's quota was made because a producing member—now known to be Bolivia—cannot meet its quota. It is also rumoured that Indonesia will experience some difficulty in filling its quota.

Overall demand is reasonably satisfactory so that there is no reason to believe that the present price of tin will go much lower or, for that matter, much higher. Stocks in London are falling gradually and at the end of last week stood at 7,900 tons, of which 4,648 tons were held in London, 2,512 tons in Liverpool and 740 tons in Hull. In the US the market is easier and the price has been fluctuating narrowly around $1 a pound.

Lead is a better market in London than in New York. Demand on this side of the Atlantic is good and the price is now around £78 a ton. The New York spot price is holding at 12 cents a pound, equivalent to £96 a ton.

Zinc seems to have found its feet again in London and consumer demand is pressing on a market not too well supplied. The price is now around £91 a ton in London, and is unchanged in the US with the East St. Louis spot price at 13 cents a pound.

Opportunities for Young People to Train for Industry

Four years ago the Minister of Education, Sir David Eccles, launched the Government's plan for expanding technical education, and since then the technical colleges have produced about half of the 50,000 scientists and engineers who have obtained degrees and professional qualifications. The colleges have also helped to train over 200,000 craftsmen and technicians in industry.

To make more widely known the opportunities which now exist for school-leavers to train for industry and commerce, the Ministry of Education is sending to all local education authorities a poster called "Your Future in Industry." This shows how a boy leaving school at 15 or 16 can become a fully-qualified technologist, also featured are the full-time "sandwich" courses leading to the new Diploma in Technology, which is equivalent to a university honours degree. Post-graduate studies now being planned by the colleges will lead to the new M.C.T. (membership of the College of Technologists) at PH.D. level.

Copies of the poster may be obtained free of charge from the Ministry of Education, Curzon Street, London, W.1.

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Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

March 23, 1960

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2, 10-ton lots or over: Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.40 per cent. P, 10-ton lots or over, £23 5s. 0d., delivered Birmingham, £23 10s. 0d., delivered Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.; North Zone, £26 6s. 6d.; South Zone, £26 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent., 10-ton lots or over: N.-E. of England (local iron), £23 19s. 0d.; Scotland (Scotch iron), Zone S.1, £24 5s. 6d.; Sheffield, £25 7s. 6d.; Birmingham, £25 14s. 0d.; Wales (Welsh iron), £23 19s. 0d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire in 10-ton lots or over.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £41 10s. 0d. to £44 0s. 0d., scale 15s. 0d. per unit, lumpy; 75 per cent. Si, £57 0s. 0d. to £62 10s. 0d., scale 15s. 0d. per unit, lumpy.

Ferro-Vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 10d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 11s. 8d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 14s. 8d. per lb. of W.

Ferro-chrome (6-ton lots and over, lumpy).—4/6 per cent. C, £78 10s. 0d. to £82 10s. 0d., basis 60 per cent. Cr. scale 26s. 0d. to 28s. 6d. per unit; over 6 per cent. C, £77 0s. 0d. to £80 10s. 0d., basis 60 per cent. Cr, scale, 26s. 0d. to 28s. 6d. per unit; 2 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 1 per cent, C,* 1s. 8½d. to 1s. 11½d. per lb. Cr; 0.15 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.10 per cent C,* 1s. 9¾d. to 2s. 0¾d. per lb. Cr; 0.06 per cent. C,* 1s. 10¼d. to 2s. 1d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £275 0s. 0d.; 96/98 per cent., £285 0s. 0d.

Ferro-columbium.—65/67 per cent., Cb + Ta, 19s. 9d. per lb., Cb + Ta.

Ferro-manganese (Standard).—78 per cent., £63 10s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t., 100 tons & over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 6 to 35 tons, £33 15s. 6d.; hard (0.41 to 0.60 per cent. C), under 10 tons, £34 17s. 0d.; silico-manganese, under 10 tons, £43 16s. 6d.; free-cutting, under 10 tons, £36 14s. 6d. SIEMENS MARTIN ACID (under 10 tons): Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d.

Billets, Blooms, and Slabs for Forging and for Stamping (under 10 tons).—Basic, soft, up to 0.33 per cent. C, £38 10s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

FINISHED STEEL

Heavy Plates and Sections (1 ton to 10 tons).—Ship plates (N.-E. Coast), £41 12s. 0d.; boiler plates (N.-E. Coast), £44 2s. 0d.; floor plates (N.-E. Coast), £43 10s. 0d.; angles (N.-E. Coast), £38 16s. 6d.; joists (N.-E. Coast), £38 12s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.; hoop and strip, coils, 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3 mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over, £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over, £68 5s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £68 10s. 0d.; nickel-chrome, £99 4s. 0d.; nickel-chrome-molybdenum £111 17s. 0d., in lots of 5 tons to under 10 tons.

NON-FERROUS METALS

Copper.—Cash, £253 0s. 0d. to £253 10s. 0d.; three months, £237 5s. 0d. to £237 10s. 0d.; settlement, £250 0s. 0d.

Copper, Tubes, etc.—Solid-drawn tubes, 2s. 5d. per lb.; rods, 269s. 6d. per cwt. basis; 20 s.w.g., 304s. 6d. per cwt.

Tin.—Cash, £787 10s. 0d. to £788 0s. 0d.; three months, £786 0s. 0d. to £786 10s. 0d.; settlement, £788 10s. 0d.

Lead (Refined Pig).—Second half March, £77 5s. 0d. to £77 7s. 6d.; second half June, £76 2s. 6d. to £76 7s. 6d.

Zinc.—Second half March, £92 5s. 0d. to £92 7s. 6d.; second half June, £90 10s. 0d. to £90 15s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £126 5s. 0d.; rolled zinc (boiler plates), all English destinations, £124 0s. 0d.; zinc oxide (Red Seal), d/d buyers' premises, £100 0s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 11⅞d. per lb.; sheets to 10 w.g., 215s. 3d. per cwt.; wire, 2s. 10d.; rolled metal, 215s. 3d. per cwt.

Brass (Brazing).—BS1400, B3, £166; B6, £221.

Brass (High Tensile).—BS1400, HTB1, £197; HTB2, £218; HTB3, £229.

Gunmetal.—BS1400, LG2, £208; LG3, £218; G1, 1%, £276; G1, 1%, £263.

Phosphor Bronze.—BS1400, PB1 (AID released), £306; BS1400, 90/10/1, £294.

Leaded Phosphor Bronze.—BS1400, LPB1, £230.

Phosphor Bronze Strip, etc.—Strip, 309s. 3d. per cwt.; wire, 4s. 2⅞d. per lb.; rods, 3s. 6d.; tubes, 3s. 6d.; chill cast bars, solids 3s. 5¼d.; cored 3s. 6¾d. (CHARLES CLIFFORD, LIMITED).

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 4s. 0d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 5d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 4d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 2½d. to 2s. 3d. per lb. Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £70 10s. 0d. to £71 0s. 0d. Nickel, £600 0s. 0d. Aluminium, ingots, £186 0s. 0d.; aluminium bronze (BS1400), AB1, £256; AB2, £263.

* Average 68–70 per cent.

Law Cases

Employees Tempted

G. R. Thomas Limited, of Walsall, were told by Walsall magistrates that they put temptation in the way of their employees by not sorting non-ferrous from ferrous scrap destined for the furnaces. The court had been told that the amount of non-ferrous metal was considered to be too little to be worth separating, but in five months four employees had sorted out more than £100 worth of scrap copper and brass which they sold. The Chairman of the Bench, Mr. S. Eglinton, told Mr. G. H. Dugmore, an executive of the firm, "I do not want to interfere in your business but your methods of mixing ferrous and non-ferrous metals—with non-ferrous at the price it is—means you are putting a very great temptation in the way of your employees."

Plaintiff's Contributory Negligence

A Rotherham lorry driver, who had his left hand amputated as the result of a colliery accident, was awarded £2,250 damages and costs by Mr. Justice Salmon at Sheffield Assizes. Mr. Charles Peter Helliwell (26) claimed against the National Coal Board for damages for injuries sustained when his hand was trapped between a chute and a conveyor at Grange Colliery, near Rotherham, in February, 1957. The judge said that Mr. Helliwell had ignored a colleague's warning so there was "a very substantial amount of contributory negligence." He assessed this at 50 per cent.

Labourer who fell gets £3,250

A labourer who stepped on a loose brick and fell after stripping the bricklining from a pipe was awarded £3,250 damages from his former employers, Cochranes (Middlesbrough) Foundry, Limited, at York Assizes.

The plaintiff, Mr. Francis James Hinde (44), said the accident occurred at the works in 1958 when he was climbing down backwards. He was now permanently incapable of doing heavy work and could not find another job.

Mr. Justice Salmon said that a ladder should have been supplied by the firm. He entered judgment with costs for Mr. Hinde.

£500 for a Finger

Agreed damages of £500 and costs were awarded against the Osborne Foundry and Engineering Company, Limited, Sheffield, at Sheffield Assizes on March 2, to Mr. Sidney Stocks, formerly a steel casting inspector for the firm. In February 1954, Mr. Stocks lost the middle finger of his right hand when a workmate hit it with a sledgehammer. Mr. Stocks, aged 42, was said to be working now as a boxmaker. Mr. G. F. Leslie, for Stocks, told Mr. Justice Salmon that the parties had come to terms.

Insecure Fencing

High Duty Alloys, Limited, were fined £50 with £4 costs at Redditch Magistrates' Court, having pleaded "Guilty" to a charge of not securely fencing the transmission of a lathe. A machine fitter, who slipped on some oil, lost three fingers when his left hand was caught in the pulley drive of the lathe. For the firm Mr. Norman Duffill said that a workman had removed the guard without authority.

THE GLASGOW OFFICE of Turner Brothers Asbestos Company, Limited, has been moved to 80, York Street, Glasgow, C.2.

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REFRACTORIES

Company News

INCO of Canada doubles Earnings

Earnings of the International Nickel Company of Canada, Limited, in 1959 reflected "one of the sharpest and swiftest recoveries in demand for nickel in the history of the industry," say Mr. John F. Thompson, chairman, and Mr. Henry S. Wingate, president, in their annual report. For the first time the company delivered more than 300,000,000 lb. of nickel in a single year. This contrasted sharply with the 1958 deliveries which plunged from the near-record of 1957 to the lowest level for more than a decade.

Net earnings for the company and its subsidiaries for the year ended December 31, 1959, were US$85,157,000—equal $5.83 a common share. These earnings compare with $39,665,000 ($2.71 a share) in 1958 and $86,141,000 ($5.90 a share) in 1957. Total capital expenditure in 1959 was $66,902,000, more than two thirds of which was spent on developing the new nickel project at Thompson, Manitoba. Capital expenditure for 1960 is estimated at upwards of $70,000,000.

Last year the company paid dividends of $3.00 per share compared with $2.60 in 1958, and $3.75 in 1957. On February 1, 1960, the board raised the quarterly dividend from 65 cents to 75 cents a share and recommended for April 27 that the shares be split on a two-for-one basis. The increased dividend would be equivalent to 37½ cents a share quarterly after carrying out the split.

A. A. JONES & SHIPMAN, LIMITED, manufacturers of machine and small tools, of Leicester—Trading profit recovered from £190,276 to £281,113 in 1959. The total dividend is 30 (25) per cent., with a 25 per cent. final.

SAMUEL OSBORN & COMPANY, LIMITED, manufacturers of high-speed steel and tool steels, of Sheffield—The interim dividend for the year to July 31, 1960, is raised to 10 (7½) per cent. The 1958-59 total was 27½ (20) per cent.

BAMFORDS, LIMITED, agricultural engineers and iron-founders, etc., of Uttoxeter (Staffs)—The dividend is raised to 17½ (15) per cent. for the year ended September 30, 1959. The group net profit is £176,217 (£167,334), after tax of £157,399 (£151,203).

NEWTON, CHAMBERS & COMPANY, LIMITED, iron-founders, etc., of Sheffield—Final dividend of 11½ per cent. is announced, making 17½ per cent. for 1959 against 16 per cent. previously. Group trading profits rose from £1,243,610 to £1,404,711 and the net profit from £436,601 to £558,097.

CORROSION TECHNICAL SERVICES, LIMITED—John Mowlem & Company, Limited, civil engineering contractors, etc., of London, S.W.1, has recently acquired 110 £1 ordinary shares in the company. This is the total number of shares the company has issued out of its capital of 1,000 ordinary shares of £1 each.

SWITCHGEAR & COWANS, LIMITED—Final dividend is raised by 2½ per cent. to 12½ per cent., making 17½ per cent. for 1959, against the equivalent—adjusting for the 100 per cent. scrip issue between interim and final—of 15 per cent. for 1958. Group trading profits were £339,055 (£282,384) and the net profit is £118,278 (£71,554), after tax of £117,580 (£112,950).

J. BROCKHOUSE & COMPANY, LIMITED, dropforgers and makers of iron and steel castings, etc., of West Bromwich (Staffs)—The offer made on behalf of the company by Philip Hill, Higginson, Erlangers, Limited, to acquire the 574,710 5s. ordinary shares of Albion Drop Forgings Company, Limited, not already owned by the company has been accepted by the holders of more than 88 per cent. of the shares. The offer is now unconditional and will remain open for acceptance until further notice.

FLUIDRIVE ENGINEERING COMPANY, LIMITED—A further loan of £80,000 has been obtained from the Industrial & Commercial Finance Corporation. This raises the total secured loan from ICFC to £250,000. Record sales output was achieved in the year to September 30, 1959, exceeding 1957-58 by 35 per cent. The intensive effort to raise production, reduce the work backlog, and generally shorten deliveries was, perhaps, the year's biggest advance, states the chairman, Mr. J. F. Perry.

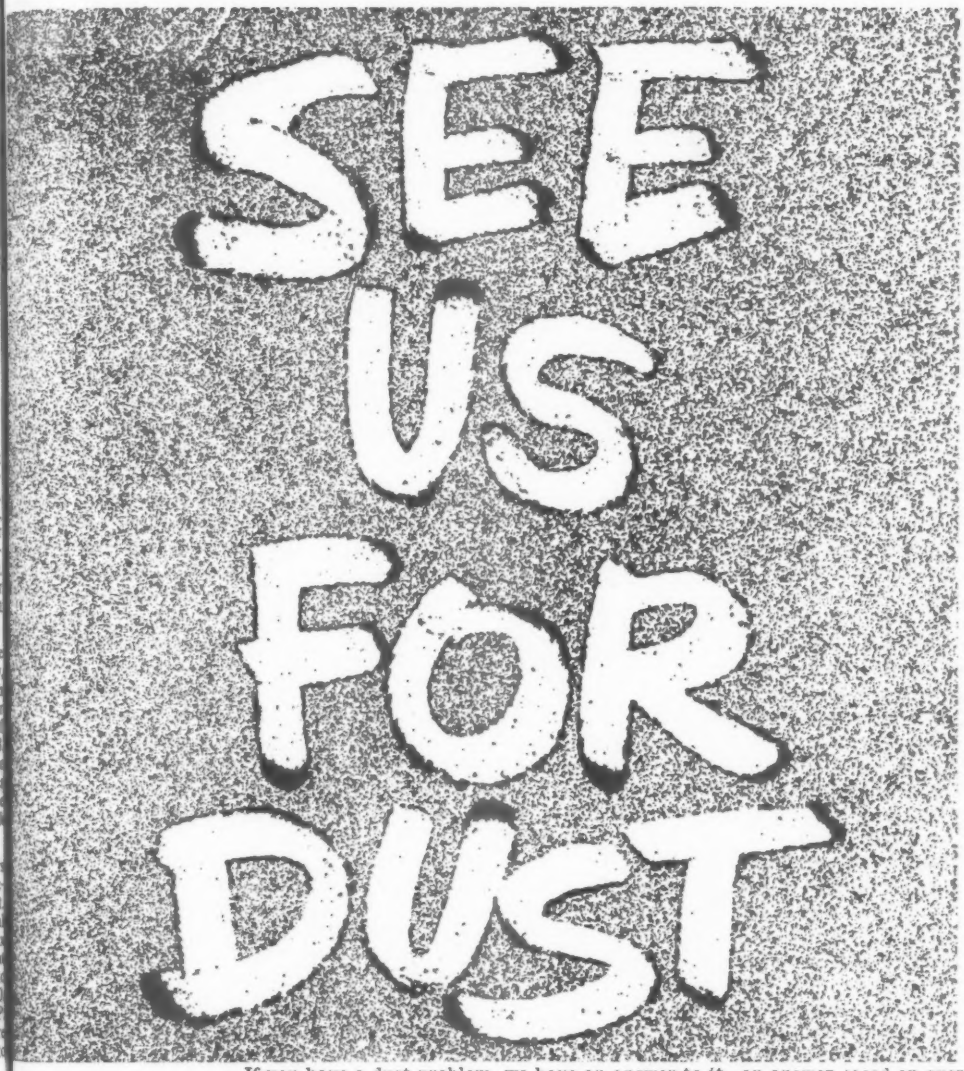
DAVID BROWN CORPORATION, LIMITED—Consolidated profits for the year ended June 30, 1959, were £167,598 (£703,336) after a special credit received by way of compensation of £100,000 (nil) was brought in. The directors state that abnormally heavy expenditure on research, the development of new products, and the reorganization of certain manufacturing divisions have materially affected the results. As in previous years, it is not proposed to recommend the payment of any dividend on the ordinary.

HILGER & WATTS, LIMITED, scientific-instrument makers, of London, N.W.1—For the year ended September 30, 1959, group profits were £126,575 (£112,754). The effective dividend total remains at 15 per cent., with proposed one-for-five scrip issue and one-for-four rights issue at 21s. per 5s. share. A 15 per cent. dividend total is expected on increased capital for 1959-60. The chairman, Mr. G. A. Whipple, says that the order rate which continues to increase exceeds present output and that extensions are being made.

C.V.A. JIGS, MOULDS & TOOLS, LIMITED—There were increasing demands for the products of the company, said the chairman, Sir John Eldridge, on March 15 in his statement covering the nine months to September 27, 1959. There was a profit before income tax of £65,297 compared with £84,320 for the full year 1958. A dividend of 1½ per cent. less tax is declared on the ordinary shares for the period, compared with 2 per cent. for 1958. The meeting agreed that the name of the company should be changed to Kearney & Trecker-C.V.A., Limited.

MORPHY-RICHARDS, LIMITED, makers and distributors of electrical appliances, of Orpington (Kent)—One-for-one scrip issue is being made and an 8 per cent. interim dividend will be paid on the increased capital (5 per cent. equivalent). Group turnover in the six months ended December 31, 1959, increased by about 25 per cent. over the corresponding 1958 period to about £6,500,000. Before tax, profits exceeded £650,000, an increase of 39 per cent. The chairman, Mr. F. P. Bishop, says in an interim report that tax will require at least half the balance, leaving a net profit equal to 5 per cent. of the turnover.

W. G. ALLEN & SONS (TIPTON), LIMITED—Although net results of subsidiaries for the first half of the financial year showed a satisfactory profit, the parent company's loss exceeds these profits, so that the group as a whole made a small loss, says the chairman, Mr. Robert Hampshire, in an interim report. Orders received during the past four months have substantially exceeded output and there is now about six months' work in hand, but he warns that narrow margins have had to be quoted. Because of difficult trading conditions the interim on the ordinary was passed last month. On account of 1958-59, ho'ders received a total dividend of 15 per cent., including two 2½ per cent. interims.



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SITUATIONS WANTED

YOUNG MAN, 22, seeks position as trainee representative or similar. Six months in sales department with four years' experience in foundry. Box YM518, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER (42), M.I.B.F. seeks position in Scotland. Experienced Ferrous, Non Ferrous Castings and Patternmaking, Estimating. Would consider Technical Representative. Box FM479, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN seeks position, grey iron foundry up to 5 tons. Age 41. A.M.I.B.F. Capable of full control. Anywhere, but preference for Midlands.—Box FO474, FOUNDRY TRADE JOURNAL.

PRACTICAL FOUNDRY MANAGER/SUPERINTENDENT, Whiteheart, Blackheart, Grey, 14 years' executive jobbing or mechanisation desires post with progressive company, Wolverhampton area. —Box PF470, FOUNDRY TRADE JOURNAL.

YOUNG FOUNDRY EXECUTIVE cast iron (31) with National Foundry College Diploma and Higher National Certificate in Metallurgy seeks position where initiative and fully comprehensive foundry experience are required. Present position complete control Sand Foundry (jobbing and mechanised). A.M.I.B.F. Salary £1,500/£1,750. Box YF503, FOUNDRY TRADE JOURNAL.

FOREMAN Pattern Maker, age 39, used to supervisory, and estimating, of high class wood pattern making, seeks similar position. West Midlands preferred. Box FP505, FOUNDRY TRADE JOURNAL.

YOUNG FOUNDRY EXECUTIVE, highly qualified in foundry technology and metallurgy. Seeks position as ASSISTANT FOUNDRY MANAGER. Present occupation has involved the development and installation of two specialised casting processes, with full metallurgical control and the training of personnel. Position envisaged would be with a well established foundry, finding itself forced to introduce more up-to-date techniques due to the ever increasing need for higher efficiency coupled with higher quality castings. Box FE504, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER (51) seeks position. Eight years' executive. Accustomed full control. Estimating, ferrous and non-ferrous, fully and semi-mechanised plants, floor moulding and patternmaking. Metal and Sand control. Box FM513, FOUNDRY TRADE JOURNAL.

TWO FOUNDRY TECHNICIANS, pattern maker and foundryman. Ages early 40s. Expert administrators in management, require positions superintendent and assistant or similar capacity. Fully conversant all modern methods of cylinder production. Positions considered abroad. Box TF511, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN required for small aluminium and bronze foundry in Glasgow. Must be a competent organiser and able to achieve efficient production of a wide range of alloys. Box FF517, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

ASSISTANT FOREMAN required for Centrifugal Casting Dept. at modern Iron Foundry. Initial salary about £950 with prospects of advancement. Centrifugal casting experience desirable but not essential. Midlands area. Replies which will be treated in strictest confidence with details of age, experience and education, to Box AF512, FOUNDRY TRADE JOURNAL.

SHELL MOULDING. (IRON). Charge hand, experienced, to take charge of Shell Moulding Plant. West Bromwich area. Capable of handling male and female labour. State age, experience and wages to Box SM510, FOUNDRY TRADE JOURNAL.

CORESHOP CHARGEHAND required by a West Midland Ironfoundry producing repetition castings. Applicants should have a sound experience in quantity production of cores with emphasis on quality. Reply stating age, experience and salary required. Box CH496, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN required for small non-ferrous jobbing shop. London area. Box FO499, FOUNDRY TRADE JOURNAL.

MIDLAND Blackheart Malleable Iron Foundry requires the services of young foundryman with drive and initiative. Must have thorough knowledge of machine moulding. First class opportunities of advancement. Pension scheme. Full sports and social facilities. Staff appointment. Write giving full details of age and experience to Box MB500, FOUNDRY TRADE JOURNAL.

PATTERNMAKERS—Wood and Metal—required. Coventry Area. High rates —Bonus. Ideal conditions. Box PW514, FOUNDRY TRADE JOURNAL.

SENIOR METHODS ENGINEER required for modern non-ferrous foundry specialising in pressure castings up to 2 tons in weight. Wide foundry experience is necessary. Housing assistance given if required. Apply giving full details of experience to Box SM502, FOUNDRY TRADE JOURNAL.

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EAST ANGLIAN Ironfoundry require foreman capable of taking charge of all operations. Both loose pattern work and machine moulding are practised. Principally repetition work on light castings. Box EA506, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—con

ERECTION SUPERVISOR prefe with experience in conveyor general mechanical handling equip required to control contracts in Eng and Wales. Erection staff of 15 erectors plus labourers. Must have vious experience as a chargehand. salary and expenses with use of car. Contributory pension scheme. ences required and full details of pre experience to Box ES509, FOUNDRY JOURNAL.

ASSISTANT to Foundry Manager quired by small expanding Steel Foundry, South Yorkshire area, bining jobbing and machine mou practices. Preferably 25-35 years of Ability in handling foundry perso estimating and knowledge of modern techniques looked for. Apply Box FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN aged 30-35 required as first assistant to Fou Manager at well known progressive ferrous foundry in N.W. manufact bronze and light alloy castings. A rea expansion programme is in operation. the appointment calls for a ma character, initiative and ability to c all grades of labour. Box FF481, Fou TRADE JOURNAL.

GOOD OPENING in Midlands are for Foundry Manager. Appli should have sound knowledge of machine and mechanised production preferably experience of cupolas, meta sand control.—Write giving age, exper and history of previous employmen Box GO490, FOUNDRY TRADE JOURNAL

YOUNG ASSISTANT to Fou Manager required by W. H. I Derwent Foundry & Engineering W Whatstandwell, Nr. Matlock, Derby Knowledge of Metallurgy an advan Write giving details of practical technical knowledge, age and salary quired.

A FOUNDRY MANAGER requir control Malleable Iron Found Midlands. Prospect of directorship fo able man, who can prove his worth perience more important than age. Pe scheme. Top salary. Write giving particulars to Box 5086. MASON-P LIMITED, 184, Strand, London, W.C.2.

EXPERIENCED MOULDERS re to act as technical instructo large South Wales Iron Foundry. E ence in production of large castin loam, dry, and green sand. Duties include training of apprentices and moulders. This is a staff appointme a contributory superannuation sche in operation.—Write giving detail The Works Accountant, Guest Kee & Steel Co., Ltd., Ivor Works, D Glam.

REPRESENTATIVES required on Foundries in all areas to additional line Moulding Box Pla general maintenance of Foundry ment, also general machining. Liber mission. BRADSTEEDS LIMITED, Bradle ston, Staffs.

SITUATIONS VACANT—*contd.*

FOUNDRY FOREMAN.—Well established aluminium foundry requires Foundry Foreman with practical experience in Gravity and Pressure Diecasting, building and melting of aluminium alloys. To take charge of Foundry employing 40/50 personnel and must be accustomed to handling labour. Staff appointment for capable person. Apply in writing, giving details of experience and salary required, to THE NORTHERN DIECASTING COMPANY, LIMITED, Norcastal Works, Wigley, Lancs.

WANTED.—Charge hand moulder/closer for steel foundry in North of England. Good rates of pay and Subsistence Allowance paid. Apply Box WC486, FOUNDRY TRADE JOURNAL.

TECHNICAL REPRESENTATIVE required in South-West area, extending north to the Midlands, for well-known manufacturers of Foundry Sand Binders. Varied appointment with expenses, bonuses and car provided. Applicants should be foundry qualified as well as having practical experience with mould and core sands. State personal details, particulars of education and experience. Box TR457, FOUNDRY TRADE JOURNAL.

WORKS MANAGER for small Non-ferrous Foundry, Machine and fabbing work. Situated near London suburb. Estimation experience an advantage. Write giving details of practical and technical knowledge, age and salary required. Box WM480, FOUNDRY TRADE JOURNAL.

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The British Cast Iron Research Association requires men with technical experience in the ironfounding industry and thorough training in metallurgy or engineering for appointments in its Development Department.

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All applications treated in strictest confidence.

AGENTS

AGENT desires to contact Birmingham manufacturers of non-ferrous castings with view to introducing work on commission only basis. Box AD495, FOUNDRY TRADE JOURNAL.

AGENTS—*contd.*

AGENTS, already calling on foundries, required to introduce foundry vibratory equipment, shell moulding and core equipment, die coats and die machine lubricants. Commission basis. Please state area covered to Box AG501, FOUNDRY TRADE JOURNAL.

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WANTED. Ladle for steel. Capacity 14/17 tons. With or without mechanical tipping gear. Bottom pouring gear an advantage. Box WL498, FOUNDRY TRADE JOURNAL.

NEW or second-hand core stove required, 7 ft. 6 in. × 7 ft. 6 in. × 7 ft. high approximately, with double doors on one side to accept rail mounted core trolley. Stove to be gas or preferably oil fired. ROBERT CORT & SON, LTD., Reading Bridge Ironworks, Reading.

EDGWICK and REED Prentice Cold Chamber Diecasting machines required urgently. Box EA516, FOUNDRY TRADE JOURNAL.

URGENTLY REQUIRED one Foundry Appliance and Engineering Company 10 ft. electric radial arm Sand-slinging unit, with 400/440 v., 3-phase, 50 cycles a.c. motorised feed Elevator, Conveyor and slinger, Pantograph arm and mobile steel base. State price and where can be inspected. WILLEY & Co., LTD., Engineers, P.O. Box 13, Exeter.

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PATENTS

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MISCELLANEOUS

US FOUNDRY marketing organisation is interested in acquiring items for import, manufacture, or distribution in USA and Latin America. Will also consider processes and techniques suitable for licensing. Principal will be in Britain early April, 1960.—Box US471, FOUNDRY TRADE JOURNAL.

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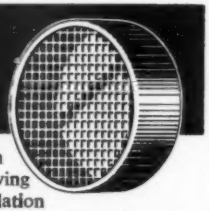

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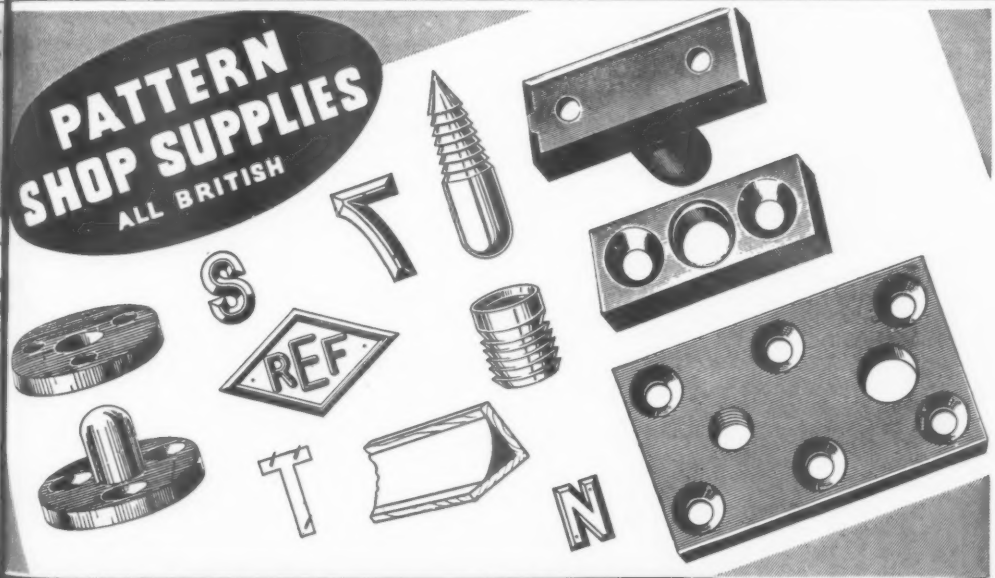
March 10, 1960



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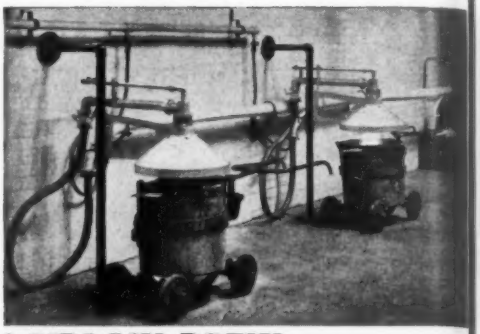

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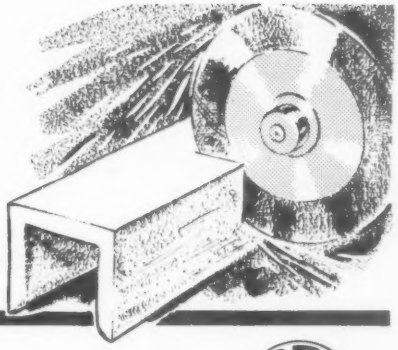

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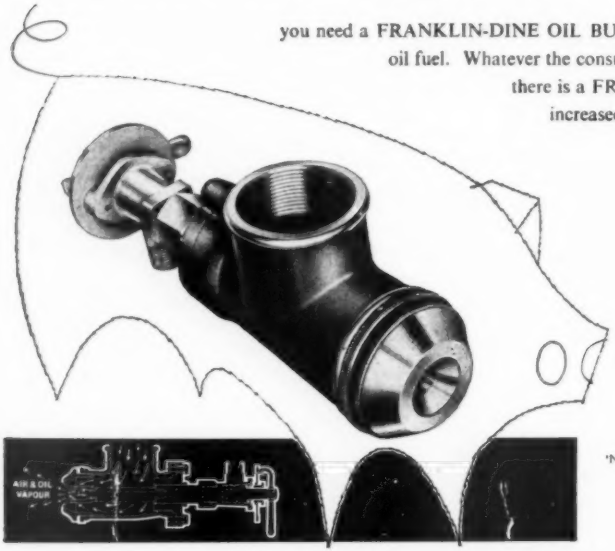

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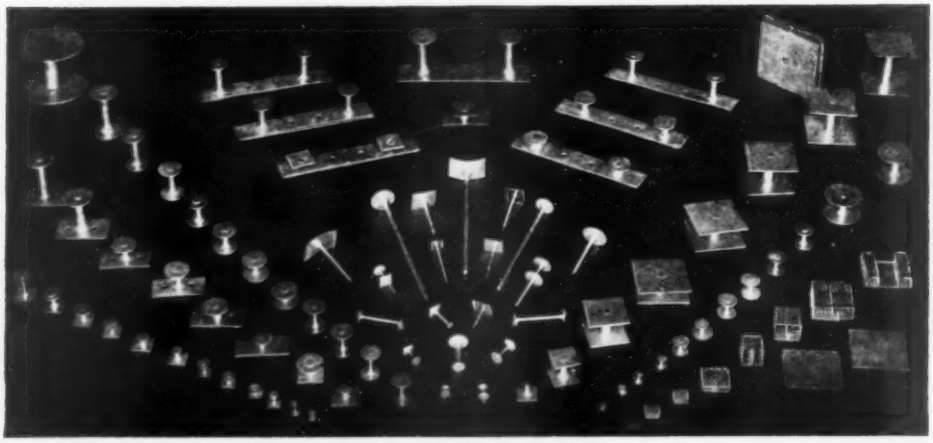

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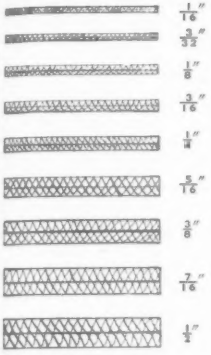

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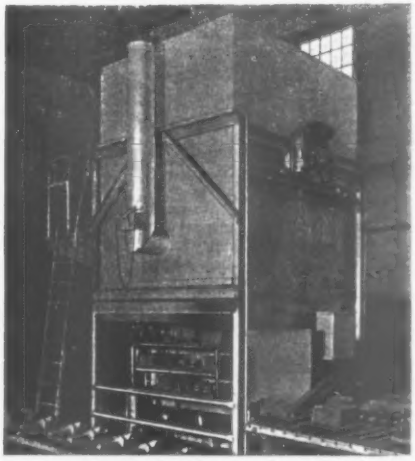

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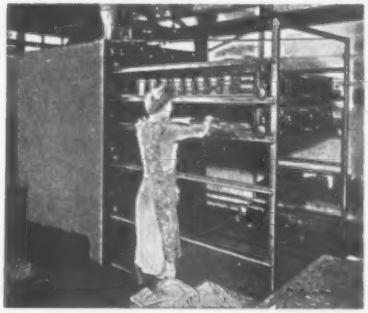

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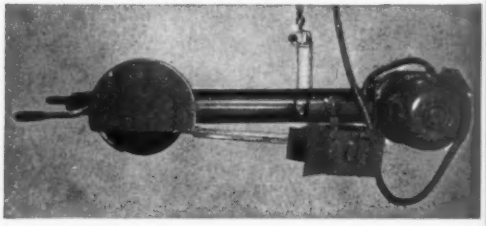

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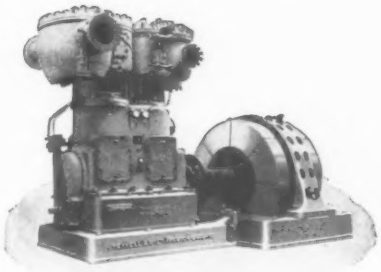

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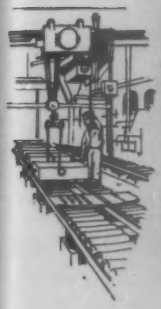

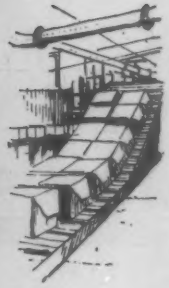

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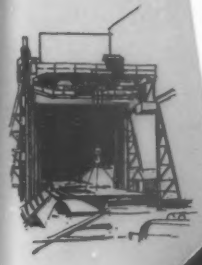

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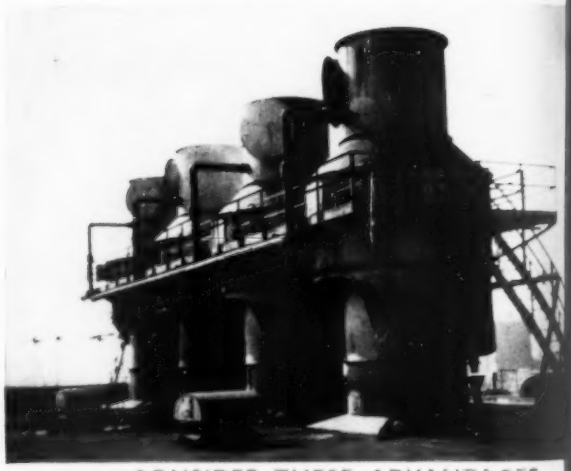

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